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Contents

SICKNESS AS AN INSURABLE HAZARD.
Mac F. Cahal, J.D., Chicago, Illinois..... 611

THE ASSOCIATED MEDICAL SERVICE OF TORONTO.
J. A. Hannah, B.A., M.D., Toronto, Ont., Canada 616

A STUDY OF OSTEOPOROSIS BY MEANS OF CONTROLLED X-RAYS OF THE BONES. Part II.
R. S. Ylvisaker, M.D., and *E. L. Gardner, M.D.*, Minneapolis, Minnesota 625

TERATOMATOUS CHORIONEPITHELIOMA OF THE OVARY.
Rodney F. Sturley, M.D., Minneapolis, Minnesota 629

INTERAURICULAR SEPTAL DEFECT.
William S. Tinney, M.D., and *Arlie R. Barnes, M.D.*, Rochester, Minnesota..... 637

CLINICAL-PATHOLOGICAL CONFERENCE.
Presentation of a Case.
Frank C. Andrus, M.D., Minneapolis, Minnesota 644

HISTORY OF MEDICINE IN MINNESOTA:
History of the Minnesota State Medical Society (Concluded).
Arthur S. Hamilton, M.D., Minneapolis, Minnesota 646

PRESIDENT'S LETTER 650

EDITORIAL:
The National Physicians' Committee 651

The Doctor in Service 652

More About Enlistment..... 653

Selectees Rejected Because of Tuberculosis..... 653

War Savings Bonds 654

MEDICAL ECONOMICS:
How and When 655
Wartime Changes 656
Minnesota State Board of Medical Examiners... 657

INDUSTRIAL HEALTH:
Worker Health Measures in Twenty-five States.. 658

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY:
Meeting of March 5, 1942..... 659

Traumatic Disorders of the Peripheral Vascular System.
U. Schuyler Anderson, M.D., Minneapolis.... 659

Thrombosis of the Axillary Vein.
Henry E. Hoffert, M.D., F.A.C.S., Minneapolis 664

IN MEMORIAM 668

REPORTS AND ANNOUNCEMENTS 669

WOMAN'S AUXILIARY 670

OF GENERAL INTEREST..... 672

BOOK REVIEWS 676

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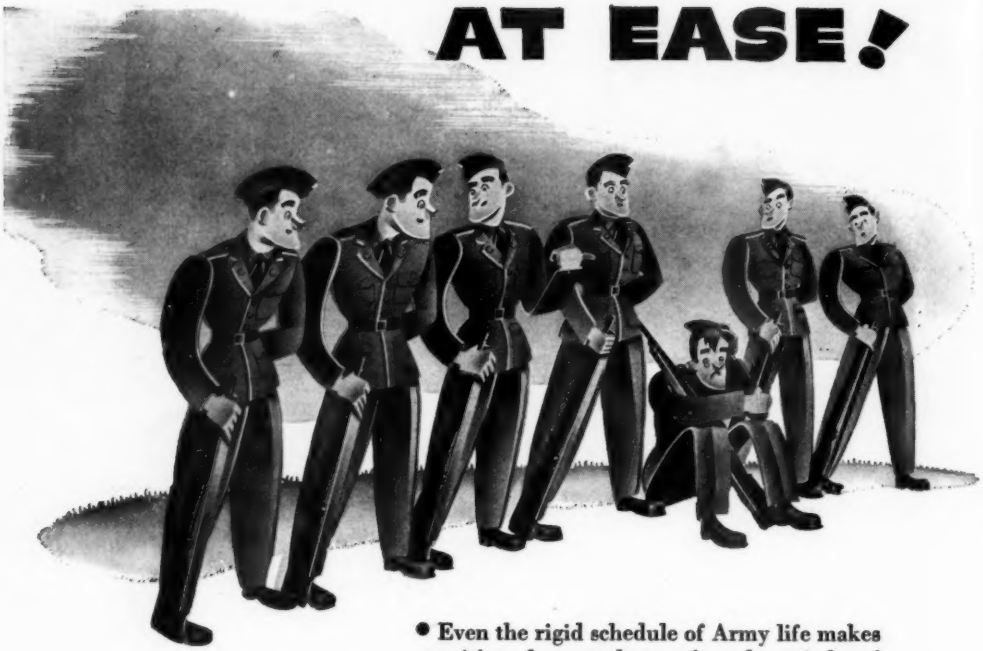

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 25 August, 1942 No. 8

SICKNESS AS AN INSURABLE HAZARD

MAC F. CAHAL, J.D.

Executive Secretary, The American College of Radiology
Chicago, Illinois

BRUCE BARTON is author of the statement that the present era is one of organized minorities, each working against the other. Now, that may be a deplorable state of affairs, but from certain viewpoints at least it is more or less true; and if it is true, the meaning for medicine is clear. Medicine too must maintain a strong organization if it is to be properly represented in the kaleidoscopic changes our civilization is presently undergoing.

I am an exponent of the premise that the doctor should occupy a more active place in the civic life of the community that is usually the case today. Under the democratic process there is only one way he can effectively do this, and that is through a strong organization that will make his voice an articulate influence in the political, social and economic developments of the community. It is my personal opinion that a full time executive is essential to the successful accomplishment of the aims of any organization—medical or otherwise. Consequently, I think that the very first step for any medical society contemplating a program in medical economics as ambitious as the one you are contemplating should be to employ a full time executive with the proper qualifications to correlate the activities of the organization.

It is only natural that the tide of social processes resulting from the industrialization and urbanization of our population should reach the medical profession and exert some effect upon the individuals engaged in medical practice for a livelihood. This new development began to be felt by doctors only within the last fifteen or twenty years, and only lately has medical organization come to mean anything more than a scientific body. Today the county medical society is beginning to perform functions for the local medical practitioners very similar to the functions which the chamber of commerce performs for the business and commercial life of the community. When I began my work with organized medicine ten years ago as the executive secretary of a county medical society there were only a half dozen such positions in the country. Today there must be near a hundred county and state societies which have realized that a full time executive is necessary if their organization is to be more than a monthly study club and if they are to occupy their rightful place of influence in the community.

I do not for a moment recommend that a medical society assume the character of a trade organization. I hope it will be possible for the medical profession to adjust itself to the increasingly exigent demands of society without divesting the doctor of his priestly robes. As a matter of fact, the real reason for organized effort by medical men is to retain medicine as an art and to maintain the doctor in his position close to the priesthood from whence he sprang.

The problems confronting medicine come from so many sources and manifest themselves in so many ways that it is sometimes difficult to decide just which is the best course to pursue. One of these problems is manifested in the recurring illustrations of the fact that there is a sustained attempt upon the part of professional uplifters and social zealots to institute a system of medical practice in this country that is alien to the traditional principles of Americanism. In the face of this increasing threat, organized medicine has in the

Address presented before the Ramsey County Medical Society, February 23, 1942.

last few years undertaken definite programs to meet the real or fancied need of a plan that would permit persons of low income to budget the costs of illness in a system of prepayment. Whether your local society shall embark upon a similar program is a question I presume you will be called upon to answer during the present year.

Whether or not there is an actual need for such a plan is a question open to debate. But one thing is clear: the socialization of medicine is no longer a question for academic discussion; all indications point to the fact that some kind of federalized program to remove the economic burden of illness from the individual will be enacted in the near future.

The enactment of the Social Security Act set the stage for the entry of compulsory health insurance advocates into the highest councils of our land. Since that time we have heard their arguments repeated again and again—in the President's Interdepartmental Committee on Economic Security, in the National Health Conference, in hearings on the Wagner National Health Bill, in the Capper-Epstein Bills, and in the prosecution of the American Medical Association under the Sherman Anti-Trust Law for having opposed the irregular expenditure of some $40,000 by the Home Owners Loan Corporation to finance contract practice by a corporation in the District of Columbia. Almost daily during the past few months the press has carried dispatches from Washington indicating that the social welfare crowd in the government are going to demand an amendment to the Social Security Act providing compulsory health insurance, under the theory that an additional payroll tax will provide a check against inflation. We should not be unmindful that the cloak of "national defense" may be used to usher in a radical innovation during the present emergency that could not otherwise be accomplished.

In the face of these developments we may ask whether a system of sickness insurance is needed in this country to make available adequate health service. We may point out that evidence is completely lacking that any considerable portion of our people have ever been denied needed medical care. We may ask for evidence that sickness insurance has improved the health of the people in the twenty-five countries now having compulsory systems, or that it would do so in this country. When the advocates of compulsory sickness insurance point to the high percentage of men rejected for physical defects under the Selective Service System as evidence that our people have inadequate medical care, we can counter with the fact that analysis of those figures reveals that not over 10 per cent of those rejected had physical defects which are subject to medical correction, and that the ignorance or indifference of the individual was usually responsible for their not having received treatment.

The fact is, of course, that what we are witnessing is an attempt to relieve the body politic of a gangrenous appendix by the injection of warmed sweet oil in the ear. If any problem exists, it is not because medical care is unavailable but because a portion of our people do not have sufficient money with which to pay for it. The social workers have put the cart before the horse. One of their most voluble fellow travelers has authored the statement that "the dominant motif in the establishment of every system of health insurance is the relief of poverty, not the preservation of public health" (I. M. Rubinow, *Annals*, Nov., 1933).

Payment for medical services usually takes between 4 and 5 per cent of the average family income. Of the amount so paid, the physician receives about one-third, or between 1 and 2 per cent. Manifestly, 4 per cent of an income of less than $1,000 a year per family is not sufficient to pay for the medical services that may be needed in such emergencies as occasionally occur to nearly every such family. Neither can the percentages expended for food, clothing, shelter and education from such an income be sufficient during an average year to meet even modest health requirements. Such essentials can be provided only by adequate incomes or by some form of charity. Mere application of the insurance principle will not make available to the poor services which they cannot afford to purchase.

According to the most authoritative study of income ever made in the United States, about 13 per cent of the nonfarmer families in the prosperous year of 1929 had incomes of less than $1,000 while the percentage of farm families below this sum was 55 per cent (Brookings Institution). Fifty-three per cent of the nonfarmers and 82 per cent of the farmers received less than $2,000.

It would be idle to deny that about one-third of the population in this country cannot translate

into an effective demand their need and desire for such conditions of living as are essential to good health or pay the cost of the best medical service when they become sick. But it is likewise true that all those who need medical care do not desire it. There may be more than one road to the same goal, and it would seem that the logical road to better medical care is increased income and not insurance.

But the proponents of sickness insurance argue that the real economic problem of sickness is in the uneven burden it casts upon individual families by reason of its unpredictability. By spreading the costs over a large group, it is said, the burden can be equalized and those who do not need medical care will help to pay the costs of those who do. Every man in the community carries fire insurance on his house and when one man's house burns down his loss is made up by payments that have been made by a large group over a long period of time. But here we encounter a fundamental difficulty in putting the theory of insurance into practical application to relieve the economic burdens of sickness. Either a house burns down or it doesn't—but if I say I have a pain in my belly every doctor in the city of Saint Paul can't prove that I haven't.

A fundamental characteristic of an insurable hazard is that the frequency of the happening of the event, which is the subject of the insurance, should be subject to prediction within reasonable limits of error. A necessary corollary is that the happening of the event must not be subject to the control of the insured individual, or that there must be a strong incentive or normal desire on the part of the insured individual to avoid the happening of the event which is the subject of the insurance. It is equally necessary that the insured event shall be susceptible of precise and easily understood definition. The trouble with sickness insurance is that the happening of the event is almost solely subject to the control of the insured. And once medical service has been sought with respect to a condition, the volume of service becomes largely subject to the control of the physician. Because of these two facts there are some qualified experts in the field of insurance who insist that sickness is simply not an insurable risk. They say no insurance plan will work when the control of the expense is in the hands of someone other than the carrier who will pay the bill, and when there is no precise way of determining when the event has or has not occurred.

Now, I have discussed some of the developments that have impelled the medical profession to consider embarking upon medical service plans in the hope that their control and management by organized medicine would obviate the evil effects of compulsion and political control in governmental plans. I have mentioned certain fundamental difficulties that are inherent in any type of prepayment for medical care. Whether or not organized medicine can find a solution to these difficulties is a question I am not prepared to answer. Neither am I prepared to say that voluntary plans under medical control will forestall the adoption of compulsory health insurance under the control of the government. The answer may be "yes" to both; but here are certain truths which should give us caution. In the first place, there is almost a complete lack of reliable experience upon which to base the actuarial features of a plan. In the second place, we should realize that voluntary sickness insurance plans abroad have not visibly delayed the adoption of compulsory plans but rather have been the forerunners of compulsory plans.

This being true, it does not follow that organized medicine is making a mistake in experimenting with voluntary plans. Even if the Social Security Act is amended in the next few years to provide for compulsory wage deductions on employes and compulsory taxes on employers to pay for a federal system of sickness insurance, these *voluntary* plans may very well set the pattern to be followed. All of the sickness insurance plans in European nations were built upon existing plans that had been operating for several years on a voluntary basis.

Assuming we have reached the conclusion that a nonprofit medical insurance plan, inaugurated, controlled, and managed by the local medical organization, is a wise and sound adventure, how should we begin? The first thing we will want to know, assuming enabling legislation has been enacted and the stage is set to begin, is how much it is going to cost. This is the first, and also the most difficult, question we must consider.

Several studies of the average expenditures for medical care have been made within the past ten years. The smallness of the data in the respective studies may have produced some unreliable results, but the consistency of these results is

significant. From such data as is available, it appears that the average per capita expenditure for physician's services is less than $10 per year, the average increasing substantially with increase in income level, and to a lesser degree with increase in size of community. While the premium for any plan of comprehensive medical service would properly be in excess of the present average expenditure, it is probable that if the difference is too great, the plan would be very difficult to sell and the tendency towards adverse selection would be seriously increased.

But these figures are practically meaningless when we come to establish a premium for medical insurance, for the simple reason that people do not request and pay for all the medical service they would demand if it cost them nothing. To estimate the cost of care that may be actually demanded in a prepayment plan we must turn to studies of the actual need, and we must bear in mind that when the financial deterrent is removed more service may be demanded than is actually needed.

When we come to consider the probable demands for medical services under an insurance plan we enter a sea of conjecture, and the limited experiences already recorded by existing plans do not provide figures that would be accepted as conclusively reliable by those people who know most about this subject, actuarial experts in insurance.

Probably the most reliable study of the costs of adequate medical care was one made by Bradbury, based upon a standard table of sickness rates developed by Lee and Jones from a comprehensive review of available sickness statistics. His study revealed that, if every illness were properly treated, with no allowance for malingering, it would cost $37.85 to provide adequate medical care for the average person per year, on the basis of present "Minimum" fees. Other studies have produced lower figures, but of the several made, none has indicated an annual cost below $20.00 or $25.00.

Thus, it is obvious that a conservative estimate of the cost of medical care under an insured plan will be greater than the amount that the average person is now paying for medical care. At the same time, it does not appear probable that the average person would be willing to pay an annual premium that would give the physician adequate remuneration for what is termed "adequate" medical care, that is, proper care for every case of illness.

The true cost of medical care under a prepayment plan will probably fall somewhere between the amount people now pay for medical services and the figure deduced by Bradbury as the cost for "adequate" medical care based upon the incidence of illness. In my opinion, the soundest approach to the economic problems of sickness, and the one most socially desirable, would be the adoption of a plan that would insure the family of low income against the catastrophic illnesses; not the minor condition that requires a couple visits to the doctor's office and an expenditure of $5 or $10. What the wage earner really needs protection against is the insurmountable burden which confronts him when he incurs a charge for medical services that may be 10 or 20 per cent of his annual income. The social workers tell us we should provide for prophylaxis and prevention in any medical service system—but the problems of prevention and insurance are poles apart and no single plan will provide an answer to both.

The experience in some of the medical service plans established in the past few years proves rather conclusively that the type of insurance the wage earner really wants is one that will protect him when he is faced by a really large expense, and that he is only slightly interested in a plan that pays all his sickness bills, small and large alike. This has particularly been borne out in Michigan. There the state medical society has offered two types of coverage, one for complete medical care at a monthly premium of $2.00 for an individual, and another for surgery and maternity service at a monthly premium of $0.50. They have approximately 200,000 enrolled in the surgical plan, but only about 6,000 in the plan for complete medical care.

One of the plans in New York, the Medical Expense Fund, Inc., has a deductible feature which requires that the subscriber pay $10.00 (or less according to his income) towards his bill before the benefits become applicable. This is intended to eliminate the small charges that increase the cost of insurance protection and at the same time provide protection for the serious illness. It is like the $50.00 deductible collision insurance you carry on your car.

The inclusion of a deductible feature is logically sound and consistent with good insurance

practice; but it fails to answer one of the avowed purposes of sickness insurance, as advocated by the sociologists. They ask for a plan that will remove the financial deterrent and thus encourage a patient to consult his doctor early before an incipient disease has become acute.

The New York plan contains another ingenious feature; premiums are determined according to the subscriber's income—the traditional sliding scale is applied to insurance. The plan is not undergoing a rapid growth, even though the premium for the lowest income group is only $9.00 per year.

The lack of demand for these complete medical care plans is rather eloquent proof of a fact I referred to earlier in this discussion. There is considerable room for doubt that the public really desires a plan that will permit prepaid budgeting of sickness expenses, notwithstanding the claims of the social welfare crowd. Wisconsin and the District of Columbia have both abandoned plans after it was demonstrated the enrollment would not be sufficiently large to justify continuation. After three years, the California plan has only about 30,000 subscribers out of a population of 7 million. Thus, it appears that these plans have to be sold if they are to fulfill their purpose and they are not likely to succeed if they are merely offered to the public without any of the accompanying techniques of salesmanship.

All these plans have certain basic characteristics in common:

1. They are confined to group subscribers; individual subscription adds to administrative expense and leads to adverse selection.

2. They are limited to subscribers within certain maximum income limits, usually 2 or 3 thousand dollars annually.

3. Premium rates vary from $1.00 to $3.00 per month, depending upon benefits included, with about a 75 per cent increase for couples and smaller increases for each child.

4. Benefits include all services, including laboratory procedures, roentgen diagnosis, and consultation, for the medical plans; the surgical plans are confined to "cutting operations" and maternity service, but include roentgen diagnosis and the examination of pathological tissues.

5. Payment to physicians is made on a fee basis or a unit basis. The difference is more apparent than real, because in all, the physician is the real insurer. Earned premiums are regularly prorated according to the number of units or total fees turned in. The unit in California corresponds to the $2.00 fee allowed for an office call in Michigan. The value of the unit in California has consistently amounted to about $1.35. The guarantor of the service is not the corporation, but the physician.

Now, that is about all I know about medical service plans, and as Lady Godiva said when she reached the end of her ride, I am rapidly nearing my close. I should like to have time to tell you about another plan for the payment of sickness bills, but there isn't time. The plan I would describe is one providing for postpayment instead of prepayment. I have said that the public has not taken to these insurance plans as readily as some people thought they would—human nature is not such that the average man will pay in advance for a service he is likely to need in the future. But the installment habit is firmly fixed in the average family. It was my pleasure to inaugurate one of the first postpayment plans in the country some years ago, and that plan is still operating successfully. People who cannot pay full fees for service costing a large sum apply to a medical service bureau where a social worker analyzes their pecuniary status and establishes a fee which they can pay in installments over a period of a year.

In closing, I think I should say a word or two about hospital insurance. The adoption of medical insurance plans by state and county medical societies has been stimulated by the successful experience of group hospitalization plans which now have nearly 10 million subscribers throughout the country. These plans have proved of real value. They have helped the patient, they have helped the doctor, and they have helped the hospitals which had to find some new source of revenue when their income from endowments practically ceased during the period of the depression. But group hospitalization has raised some questions of serious implication for the medical profession. Just where does hospital service end and medical service begin? Notwithstanding the fact that the House of Delegates of the American Medical Association has reaffirmed the principle again and again that group hospitalization plans should not include within their benefits the services of physicians, several of the

large plans in existence, including your own, include the services of a radiologist, a clinical pathologist, and anesthesiology as a part of hospital care. Some of them have instituted ward service plans for the low income groups that include complete medical care.

Here we are witnessing a profound departure from the traditional functions of the hospital. There is an unmistakable tendency for hospitals to assume more and more responsibilities in the delivery of medical care and unless the profession is thoroughly alert we may find the hospitals occupying the role of a middleman as a distributing medium for medical care under prepayment plans that include not only hospital accommodations but the services of physicians as well.

Perhaps this is another reason why it is desirable for medical societies to institute medical service plans. After examining all the pros and cons it appears that the disadvantages of such plans are outweighed by the advantages. We cannot expect the system of medical practice in this country to remain in the status quo, when everything else is undergoing change and when it is obvious that the status is going to be less quo for a good many years to come. It would seem, therefore, that the wisest course for Medicine would be to take the lead in directing the course of change and setting the pattern for what is to follow in such a manner that the high quality of medical care in America will be preserved and its unequalled advancement will be continued.

THE ASSOCIATED MEDICAL SERVICE OF TORONTO

J. A. HANNAH, B.A., M.D.
Toronto, Ontario, Canada

I AM afraid Dr. Sohlberg has given rather too good a build-up for the man with whom he is dealing. I thought I had impressed Dr. Sohlberg with my comparative ignorance, and that I did not pose as an oracle on the subject of health insurance. The more one deals with this problem the more one realizes how little can be comprehended of it in a short time. I will, however, endeavor to answer as many questions as possible after I have introduced the subject, as I feel that this is the best way of telling you what you may desire to know, in so far as it is possible for me to do so in the light of our four and a half years' experience in Ontario.

I have been interested in the development of health insurance, as it is commonly called, for the past ten years. For the past seven years I have been making an intensive study of the problem, and during the past four and a half years have been learning, through actual experience, how different and impractical our theories are in relation to the actual application of the principle of insurance to the provision of medical care for the general public. I think it is fair to say that we are at present, in regard to his problem, in the same position that life insurance was fifty years ago.

There is little doubt in my mind that we are going to get socialized medicine in North America, whether we like it or not. It has occurred to me that the best way of directing this inevitable system is to get in and lead it along the path which our experience shows us to be of the most benefit to the greatest number of people—the public as well as the profession.

I recently read an address by a man from a large industrial firm, giving a discourse on the question of postwar problems which would confront our system. He was, of course, dealing particularly with industry, in which he made a very strong plea for the continuation of the present individual and independent type of business. It is significant that the same man who made such a stand for the continuance of rugged individualism in business, made the statement that we must find some means of instituting socialized medicine. To me, it seems a bit incongruous that the group of men who have in the past shouldered, to the greatest extent, their responsibilities in regard to the lower income group of the population, should be held up for

Presented before the Ramsey County Medical Society, St. Paul, Minnesota, February 23, 1942.

socialization, whereas, ordinary business which has not looked after the low income group to the same extent as the medical profession, should be held up as the example for the continuation of rugged individualism.

Public opinion, however, is a peculiar entity and on many occasions these matters are not of our choosing, and in most countries, where health insurance has come into existence, it has come about as the result of demands on the part of the public.

This demand did not become apparent on this continent, until the recent so-called depression. So long as our standard of living was so much better than that in Europe, the individual has been able to carry, reasonably well, the costs in regard to medical care. The sparsity of our population may also have had something to do with the lack of spread of the idea. It is, however, becoming more and more apparent, in Canada at least, that we cannot withstand the tide of change and public demand, of which note is being taken by the governments of both your country and Canada.

Perhaps one of the greatest contributing factors to the development of this public demand has been the change in our general economic system, which has come about since the turn of the present century. I am comparatively a youngster, but I still remember when it was thought disgraceful to make a purchase on time, and if that purchase made on time were a luxury, it was considered almost criminal. That attitude has, however, all changed, particularly since 1918. Now it is considered the very best of business, both from the salesman's and consumer's point of view, to purchase anything desired, whether necessary or luxury, on the installment plan of $5.00 down and $5.00 if, and when, they catch you. It is, however, abundantly clear that the system does work. In the Province of Ontario, there is one pleasure car for every five people, and these are the very people to whom we have to supply medical care. It is a well-established fact that it costs a great deal more to purchase an automobile, let alone to operate it, than the amount spent on medical care. Why then do we hear so much about the high cost of medical care?

It appears to me that we, as a profession, have been so busy listening through our stethoscopes, or looking down our microscopes, that we have not fully appreciated the economic groans of our patients. They do pay their bills, but at what a price! I am convinced that illness is more destructive to human planning than death. If a member of a family dies, then it is all over, and readjustments are made accordingly, but a protracted illness leaves an economic responsibility which makes it very difficult to proceed with family plans.

We, as a profession, have made tremendous strides in our scientific knowledge, particularly since the turn of this century. We have not, however, kept pace with the economic developments which have been going on around us. Hence we find that the profession of medicine, and its subsidiary adjuncts, are coming out on the short end of the economic stick.

Another reason contributing to the growth in public opinion towards socialization of medicine, has been the ever-advancing cost of medical treatment. At the turn of the century an x-ray film was more or less of an oddity, perhaps even a curiosity. Now, a physician without an x-ray film is the oddity. If to this one adds the additional costs of other advances, there has been quite a formidable increase in the costs of treatment.

Perhaps if we, as a profession, will stop looking down our noses at those in our ranks who become interested in the economic aspect of the practice of medicine in a fair and honest way, we may be able to do something to alleviate the distress of our patients. This can, however, only be done if we, as a profession, approach this problem fairly, honestly and without prejudice. If we will further forget the old shibboleth that our profession is one chosen especially by God and the public, to be set on a pedestal, and that the influence of economics cannot come near us, we may be able not only to advance our economic situation, but assist the public in securing the benefits of our knowledge. At the same time we may be able to place our own researches on a self-supporting basis. I, for one, have grown heartily ashamed of the medical profession going to industry and the wealth of the country with hat in hand, begging for funds with which to carry on research, which is so essential for the welfare of the health of our population.

How then are we to approach this problem, keeping in mind that we must at no time allow such circumstances to arise which will in any

way detract from the advances in treatment of our patients from whatever point of view one may approach the problem?

It would seem to me that we can learn something from those who dispense the goods which has raised the habit of smoking from luxurious indulgence to what we frequently hear termed a necessity at the present time. It is a fact that there is more money spent on smoking on the North American continent than there is on the cost of medical care. Why then do we not hear complaints about the high cost of smoking, as is the case in regard to medical services? It would appear to me that it is due to the fact that if a packet of cigarettes is smoked up, most smokers have twenty-five cents which to purchase another packet. If not, they can purchase a smaller lot for ten cents. Or, if perchance they may be broke, they borrow a cigarette from their friends and consumption still goes forward, and we find the financial statements of the tobacco combine consistently showing a good profit. In other words the individual can buy the wherewithal to indulge himself in this luxurious habit in small quantities, so that he doesn't miss a quarter here or a dime there, but in the end, as we have seen, it amounts to more than the services which we, as a profession, have to render to these same people. I think there will be no question as to the relative value of the two products or commodities.

Let us consider for a few moments what happens if you or I or one of our patients has the misfortune to walk in front of an automobile which seems to have a more determined destination than the pedestrian. Such an unfortunate individual will have to have, and indeed will demand with no uncertainty, that an ambulance shall be available to take him to a well-equipped hospital, in which he will expect a bed to be available with a trained personnel to see to his every comfort. He will expect to be carted to the x-ray room and have pictures of all his bones and innards taken. If perchance any of them happen to be misplaced or jarred, he will expect a well-trained surgeon to be on the job within a moment's notice to operate on him in an expensively equipped operating room. He will also expect that so long as his life is in danger, or even during his convalescence, that he will be able to have his every need attended by highly trained technicians and professional individuals.

The part of this picture so readily forgotten by both the physician and the patient is the fact that the doctor, the nurse, and the technicians must live not only when an individual becomes injured or is ill, but during the period of time when such individuals maintain their health. Consequently, under our present system, while there is no installment buying of such services, the individual must pay not only for his present period of illness or accident, but he must put up his share of the cost of maintaining such equipment, trained personnel, and professional individuals, as we have cited above. Would it not be much more logical for both the profession and the public to realize that it would be ever so much easier if the individual could pay on a regular budgeted plan for the necessities of such services?

Such is the background and philosophy underlying our four and a half years' application of this principle through the organization known as "Associated Medical Services" with its head office in Toronto, Ontario, which has at the present time, some eight subsidiary branches throughout the southern part of the Province.

During the next few minutes I shall endeavour to give you some of the practical experience leading up to the organization and through the growth of Associated Medical Service, since its inception to the present time.

In 1930 I had the good fortune to be appointed Neuro-pathologist to the Department of Health in the Province of Ontario, and as such, I joined the Civil Service Association of Ontario. I almost immediately learned that that body had under consideration the establishment of a system whereby they might budget against the cost of illness. I learned, however, that they were committing the common mistake of taking what appeared to be the easiest and most obvious solution to their problem. They intended to go out and hire a group of physicians on a salary basis to give them their services.

I entered into their discussions and consideration of their plan. It was not difficult to point out to them the fallacy of their presuming that a limited number of physicians would prove satisfactory to all of their 2,000 members. I was able to convince them that choice of physician is one of the prime requisites for a successful organization, and after some three years in study with their committee, we were able to present at

their annual meeting in 1934 a plan which met with their approval.

This plan, however, presupposed the full co-operation of organized medicine, and I was detailed as a member of both the Toronto Academy of Medicine, and the Civil Service Association, to take the matter to the Academy.

The Academy, after some consideration, decided that the plan was good and that they would be prepared to lend their support, provided the plan could be extended to cover other groups in the city. The Academy further wanted to place the matter before the Ontario Medical Association in regard to the proposals. At the meeting, approval of the Council was given in 1936 to the establishment of voluntary plans, in trial areas through the Province.

On February 23 and 24, 1937, the final approval of Council and Board of Directors of the Ontario Medical Association was secured, and a loan of $3,800 granted toward the establishment of the plan. In addition to this amount, the Ontario Civil Service Association made a loan of $1,200, making a total of $5,000 for organization purposes.

It is to be noted throughout that the medical profession gave us only their approval of the plan and financial assistance was given in the form of a loan. It was felt by the medical profession that they could not afford to risk either their finances or their reputation on a plan which might quite easily prove to be a failure.

Under date of April 9, 1937, a non-profit, non-share Charter was secured from the Provincial Secretary's Department, incorporating our services under the name of "Associated Medical Services, Incorporated."

We opened our offices on June 1, 1937, in space granted to us, rent free, by the Provincial Government at number 11 Queen's Park, Toronto.

I shall now have to turn back a bit to give you an understanding of the basis on which we arrived at what our subscription rate should be.

During the course of our initial study from 1931 to 1936, much ground was covered and a great deal of literature digested, and some of us spent a considerable portion of our holidays visiting plans in operation which might have any conceivable relationship to the one which we proposed to set up.

We felt that the only safe approach to the problem would be to reduce the services required to an individual basis, and then set over against that, the fee which we proposed to pay for such services.

The first problem was to determine just what services would be required by a person during a year, in which they might have occasion to make use of the service. We reduced the services to the following items: home calls, office calls, consultations, surgery, hospitalization, special nursing, x-ray, laboratory and administration.

The next problem was to determine how much, on the average, of each of these items one individual in a large group might require during any service year. As a result of rather extensive study which has been listed elsewhere, we found somewhat as follows: There would be one home call per person per year reqired on the average, at a cost of $3.00 per call. We could expect to have 1.5 office calls per person per year, at a cost of $2.00 per call, making an additional $3.00 for the individual. In regard to consultations, it was difficult to find anything of a very definite nature in regard to the number of these, or the cost of them, but on what information we had, we struck a rate of $4.00 per person per year. Surgery was found to be required by eight persons out of every hundred, for operations of one kind or another. The average cost of such operations in Canada we reckoned to be in the neighborhood of $50.00 per procedure. That is, we could expect to have to pay out for each individual in the service .08 times $50.00, or $4.00 per person.

We found that in regard to hospitalization, by and large, we could expect an average of 1.3 days per person per year, at a cost, as we reckoned then, of $3.50 per day. This would make a total of $4.55 in regard to hospitalization for each individual per year.

Our estimate of the cost of nursing was taken prior to the introduction of the three eight-hour periods per day of nursing, and it was felt that one-half day's service per person per year, at a rate of $5.00 per day, would cover this feature, at a cost of $2.50 per person per year.

X-ray and laboratory were reckoned at a cost of approximately $1.00 per person per year.

Administration, it was felt, would incur another $2.00 per person per year.

If all these costs now be totalled up, it will be found that they come to $24.05 per person per

year. It will thus be seen that our figure was not a wild guess taken out of the air.

The figures which we have quoted are true in regard to the individual situation. They are not altogether true in regard to the family situation, or where the family unit basis comes in for consideration. In family groups up to four, there is a reducing ratio of service required in inverse proportion to the size of the family. After the average family of four has been reached, the situation reverses, and there is a mounting ratio of service required. The average size of a family in Ontario being 3.9, we were able to strike a reducing rate in the family situation, and so we set a monthly subscription rate of $2.00 for the first member of the family, $3.75 for two members of the family, $5.25 for three members in the family, $6.50 for four, and a dollar increase for each additional member in the family succeeding the fourth. On this basis, we collected our first subscription as indicated above, on June 1, 1937, and in return for that subscription, promised our subscribers the services as listed previously, namely, home calls, office calls, consultations, surgery, hospitalization, special nursing, x-ray, laboratory and administrative costs.

From the first of June to the 31st of December, 1937, we added a total of 733 subscribers. At the end of December, 1938, we had 4,020 subscribers. At the end of 1939, approximately 10,000, December 31, 1940, 20,000, and at the end of 1941 approximately 30,000, so that at the time of speaking, we have had four and a half years' experience, with a growth as indicated above.

Out of our income, we have paid all of our administrative expenses, salaries, and medical costs. We have been able to repay the loans granted to us by both the Ontario Medical and the Civil Service Association, and have accumulated a reserve of approximately $98,000 against future and unpresented claims. In addition to the above, we have assets in the form of equipment totalling approximately $25,000.

The amount of checks and controls will undoubtedly be a question which you will raise at the end of this period, and I shall therefore not attempt at this time to delineate the numerous problems, and our solutions to them, but shall endeavour to answer such questions as may be of interest to you, as they are raised.

A short discussion in regard to administrative procedures may now be in order. One of the greatest difficulties in any such plan as we have endeavoured to provide, has been the mounting administrative costs, and in many cases the administrative costs have exceeded the cost of providing medical services. After four and a half years' experience, I can well understand how such might become the case, unless the administrators are very diligent, and prepared to make changes when duplication and unnecessary procedures become apparent.

The amount of detailed work necessary in any such plan requires that the methods of mass production be applied, in so far as possible, and that automatic machines be utilized to the full. In fact, the administration of such a plan is indeed the happy and useful hunting ground of all types of office machine equipment, and if used judiciously, can become one of the organization's greatest assets.

Our administrative costs at the outset were obviously high, and to some extent the same is true at the present time. However, three years ago our administrative costs were approximately 24.6 per cent of our total income. Two years ago it was down to 21 per cent, and in 1941, had dropped to 19.5 per cent. Up to the present, during the year 1942, this administrative expense dropped to the neighborhood of 17 per cent. It is to be remembered that in this cost is included cost of acquisition of new subscribers, and the cost of administering the collection of monthly subscriptions, and the payment of monthly accounts to the physicians, both of which procedures are extremely expensive to administer.

The cost of collecting our subscriptions on a monthly basis has, however, been less than 1 per cent. At the beginning of any one month at the present time, we have in the neighborhood of 18,000 subscriptions due us. On the 15th of the month there are less than 300 subscribers still outstanding, and by the end of the month, we seldom have to cancel more than thirty subscribers for nonpayment of their subscription. This fact may be due to our Regulation which states that while any subscription is outstanding the corporation shall not be responsible for any expense incurred during such period. Under these circumstances, the subscriber makes sure that his subscription is in our office on the 1st day of the month in advance.

Much of the success of any such plan will depend upon its careful and considered administration. Although Associated Medical Services is operated on a non-profit basis, and on humanitarian lines, there is no presumption that its dollar will stretch any farther than anyone else's in ordinary business. Therefore, we take particular pains to see that no more than the service which we promised is rendered for the subscription paid. Administration must be just and fair, as well as consistent in each situation which may arise.

Through all this discussion you have undoubtedly been asking yourself the question, "How does the profession like it?" Well, it reminds me a bit of the old childish rhyme, "Pease porridge hot, pease porridge cold . . . some like it hot, some like it cold," and some don't like it at all. I think, however, it is fair to say that out of the 1,800 physicians who are actually participating with us throughout the province, 80 per cent are satisfied. That is, as satisfied as you can get any group of physicians when a radical change of principle is involved. Probably 15 per cent are indifferent. There is a 5 per cent balance who just don't like us at all, and I may say that we in our turn, do not like some of them any better.

A few of those who do not like us are, as a group, high class type of men who feel, and justly so, that they can only limit their practice by charging a heavy fee. In this group are included some of my very best friends. There is, however, another group who are not so high class, and are of not such a good calibre, who expect to receive $5.00 for every office call, and who seem to feel that nothing short of ten calls for any condition is worthy of their consideration. For these people, we have our own top ceilings and deal with them by indicating that we can get along better by going our own individual ways.

The whole organization is voluntary, and if by chance an applicant names a physican who is not participating, we immediately return his subscription and refuse to accept his application.

In regard to the subscribers, it is undoubtedly true that those with incomes of upwards of $3,500 do create a considerable amount of difficulty, as compared with those below that bracket. There are, however, a certain number even in the lower income group that feel that because they have paid their subscription that they should have attendance very frequently, and in quantities far beyond their individual capacity to pay. It is not uncommon however, for a physician to call us up and indicate, or to put a note on his account, that such and such an individual is demanding a lot of his time and service. To a certain extent these individuals may be weeded out before they become subscribers, since the family physician has an opportunity of indicating to us the type of individual, when we write to him asking for his past history. In any case, it is not long until we see from the history card whether or not they are being reasonable with the plan. If we feel that unreasonable demands are being made, we can cancel forthwith, or we can give three months' notice of cancellation, and this is not an uncommon means of handling such a situation. Starting with 20,000 subscribers at the beginning of 1941, and ending with approximately 30,000, we had 92 cancellations, for abuse of medical privileges.

Another question which may be in your mind is, "How long do your people stay with you?" In January of 1942, we made a survey of the first thousand members handed out. This represented some 1,622 subscribers. Out of this number who first became subscribers, we still had with us 78 per cent, who were obviously satisfied, or they would not be with us after four to four and a half years.

Another legitimate question may arise in your minds regarding how frequently we have to make changes in our Regulations. When we started our organization, we admitted frankly that it was on an experimental basis, and both our doctors and subscribers understood this to be true.

Just here I would throw out a word of warning to the profession. It is not to be expected that any plan can be pulled out of a hat and set to work to the satisfaction of all concerned. We might as well realize now as at any time, that however this change is brought about, there is going to be a long period of readjustment on the part of both the profession and the services before it works to the satisfaction of all concerned. Personally, I am of the opinion that nothing short of ten to fifteen years will develop any plan to the place where it is reasonably satisfactory. Nor need we expect at the end of that time that all is going to be honey and clover. The only state of complete stasis of which I know, is to be

found in rigor mortis. It is my opinion that the moment any such plan as our own becomes static, that moment will it have died.

The question is not whether or not we are going to have a period of readjustment and difficulty, but rather, the question seems to be, "How are we going to make that adjustment?" Is it to be under stress and strain; under suspicion on the part of all, or are we going to approach the problem frankly and openly, giving full coöperation to the public and government; recognizing that they too have their rights in the problem, and that we must make adjustments as well as they? If we approach this problem in this manner, there appears to be no reason why this advance cannot be made a happy experience, the same as any advance we make in regard to our professional knowledge.

Now then, Mr. Chairman, I have taken a good deal more time than I had intended when we started. It has indeed been a great pleasure to me to come to your meeting and discuss with you a problem in which I am vitally interested. If by any chance I have thrown out any suggestions which may be helpful to you as a profession, I am more than happy. I shall be very pleased to answer, to the best of my ability, any questions which may be put forward from the floor of the meeting. Once again, my sincerest thanks for paying me the compliment of having me here at your meeting.

Question 1.—Your administration cost was figured at 8 or 9 per cent. I was wondering whether there is other distributions in your original estimate which make up the amount you discussed later (19 per cent) and whether you see a possibility of increasing or decreasing the cost?

Answer.—I should have told you during my discussion that there is a two-month waiting period, during which we are not responsible for any medical services, but during which the subscriber pays the same rate of subscription. This fee is charged to cover the cost of securing application and setting up files. Last year, for instance, we had roughly, ten thousand new subscribers who each paid us, roughly, about $1.85 for each of two months, or a total of $37,000, which is in no way related to the subscription rate charged. This will account for the additional administrative expense over and above that set out in my original discussion.

In answer to the question, "How are specialists taken care of in the plan?", I would say that the basis of our service is that of a general practitioner, and if a subscriber wishes to make use of a specialist, for instance, through a pregnancy, we feel that they must bear the additional cost of that specialist. The usual fee allowed in Ontario by us for the delivery of a child to a general practitioner is $45.00, including complications. If one of our subscribers chooses to use an obstetrician throughout a pregnancy, she must pay the difference between the $45.00 and the obstetrician's usual charge.

If a surgeon chooses to charge an extra fee, over and above that allowed by the O.M.A. tariff, he must indicate so to his patient, before he begins the operation so that the individual has an opportunity of deciding whether or not he wishes to pay the additional amount to the surgeon. Generally speaking, there is not any great difficulty in regard to specialists, as the vast majority of them make no extra charge over and above the ordinary O.M.A. tariff of fees.

Question 2.—Do you take in groups, and how do you get subscribers? How do the medical profession keep control?

Answer.—The only group which we have so far recognized, is that of the family group in which application must be made on an individual basis. We will not take part of a family unless the whole family makes application.

We have secured our subscribers mainly through our satisfied customers. Our newspapers have given us a considerable boost from time to time, and, on occasion, welfare organizations, home and school clubs etc., have given us a considerable amount of assistance. On other occasions we have been asked by certain programs dealing with social welfare problems to broadcast over the radio. These are the main ways in which we secure our subscribers.

"How does the profession retain control?" In our Charter it is specifically stated that there must always be a majority of medical men on the Boards throughout the province. In all, there is a majority of at least ten medical men in membership in the Corporation. Our Charter laid down the specific ratio of laymen there must be in relation to medical men who can vote, and the majority is always medical. In this way, the final control rests in the hands of the medical profession.

Question 3.—Is there any limit on the financial status of participants, and how are special fees determined?

Answer.—There is no limit to financial status except that we have learned through experience that persons in the higher income bracket do create some difficulty, and they, therefore, now find it more difficult to get in than other individuals. The physician himself is asked if he knows of any reason why such an applicant should not be accepted as a subscriber. He thus has the right of choosing whether or not an individual shall become a subscriber.

Question 4.—Does an individual name a family physician?

Answer.—He must name a family physician when sending in his application, and he must secure all his

services through that nominated physician, unless special permission is granted to do otherwise, or in cases of emergency.

Question 5.—How are specialist fees set?

Answer.—If a specialist is not satisfied with the O.M.A. tariff of fees, he has the right to indicate before he starts on an operative procedure, to the subscriber that he will charge an extra fee. If the subscriber chooses to pay such extra fee, it is a matter of personal arrangement between the physician and his patient. In the vast majority of surgical cases there is no demand for a fee above the average, and we have not found difficulty in this regard. In regard to obstetrics, if the subscriber chooses to use such a specialist throughout a pregnancy, she can pay the difference just the same as if she chooses to pay the difference and have a private room in a hospital.

Question 6.—In case a policyholder has no physician, or the physician is not participating, has the individual the right to name such a physician?

Answer.—We will not accept such an application naming a physician who does not choose to participate.

Question 7.—Suppose the physician will not abide by the ruling of your board, would you permit him to participate?

Answer.—No. A.M.S. is a voluntary organization, and he has the right to participate or not, as he chooses If he does not wish to participate and abide by the rulings and decisions of the Corporation, then we cannot accept him as a participating physician, and anyone naming him as a family physician would be told that we could not accept his application.

Question 8.—What per cent of the medical men are in your organization?

Answer.—It varies from center to center. Generally speaking, over 92 per cent of the physicians in those areas where we operate are participating. In the city of Toronto, out of 1,200 physicians practising, we have over 1,100 participating. I am not suggesting that they are all out cheering and waving their hats for us, but they are satisfied in at least 80 per cent of cases.

Question 9.—I heard you refer, Dr. Hannah, to your plan as a coöperative setup. Is this true in the literal sense of the meaning of coöperative?

Answer.—This is not true in the ordinary sense of the coöperative, such as "Farmers' Co-operative" if that is what you mean by "coöperative." It is controlled under a charter, set up under the Companies Act of the Province of Ontario, and is run by a Board of Directors, elected each year at the Annual Meeting.

Question 10.—The point I want to make is, is there anything about your coöperative that would make it impossible for the board to change your methods? Can't they amend your Constitution at your Annual Meeting?

Answer.—"The Constitution may be amended at the Annual Meeting, but unless the profession is lax in attending such annual meeting, it is not possible for the control to pass out of the hands of the profession. If it is impossible for the medical men to attend, I have, in the past, asked them to give me their proxies. Of course, if the medical men become careless, and do not attend the Annual Meeting, it will be possible for the laymen to bring a group and change the Constitution, and upset the whole show. Our organization is not set up as a true coöperative, in the ordinary sense of the word."

Question 11.—Can a family name a physician who is participating, and then if they wish to change after becoming subscribers, choose a non-participating physician?

Answer.—They may change their physician, if they give us notice in writing. However, they can only change from one participating physician to another participating physician. If they choose a nonparticipating physician, we have to decline to accept their nomination, and cancel their subscription, if they wish to stay with that nonparticipating doctor.

Question 12.—If the cost of medicine and fees were to exceed the cost of office calls, do you make any provision?

Answer.—The only provision we make is an average of fifty cents per day while in hospital for drugs. If the doctor wishes to charge for drugs, at the time of the call, he can do so. We do not, however, pay for any drugs in addition to the office call.

Question 13.—What is the method used in handling a physician who deliberately has the patients come in too often in order to build up his practice?

Answer.—If a doctor shows too much discrepancy from the average cost, he is first asked to come in line, and if he fails to do so, it is indicated to him that we no longer wish to have him as a participating physician. Our statistics keep accurate count of the cost, both to the nominated physician and to specialists required by such a physician. A great deviation from the norm in such a situation calls for serious consideration, even dropping him as a participating physician, and it is on this basis that we handle all such matters.

Question 14.—Can a subscriber name more than one physician when he applies?

Answer.—No. Only one physician can be named for each subscriber, but each member of a family may name a different physician.

Question 15.—When a subscriber puts a doctor's name on his application, does he have to go to that particular physician? What does he do if he wants to

see an eye doctor? Does the physician suggest an eye doctor?

Answer.—That is right, the nominated doctor and the patient choose the specialist.

Question 16.—How do you handle libel? Are you subject to damage suits?

Answer.—We are not responsible for the actions of a doctor, or other person, or institution, which may cause damages to the patient. If, however, a person is not satisfied with our decision, he has recourse to the ordinary courts. In our four and a half years, we have not yet had a suit, but we have one pending at the present moment.

Question 17.—Suppose a doctor is out of town and can't get back, and a nonparticipating doctor is called in, what do you do then?

Answer.—Of course, in a case of emergency, we don't ask about it, we go ahead and pay the account, but require our subscriber to return to his own doctor at the earliest possible moment.

Question 18.—Do you find that you reach the low income group with this plan?"

Answer.—We are not reaching the very low income group, although we have 28 per cent of our subscribers with incomes of less than $1,000 per year. It will only be possible to really reach the low income group when the medical profession fully appreciate their responsibility in regard to this matter, and are prepared to make reductions in their fees, in accordance with the situation covered. That is, they can well afford to take a good deal lower fees, if they are going to be paid for the very low income group, than if the plan only covers those of the higher brackets. Such low income groups will require assistance, perhaps both from the government and their employers, as well as the coöperation of the profession, before the problem can be really solved. However, I am of the opinion that if the profession goes to work in earnest with such a plan as we have provided, it will be possible for them to reach this low income group.

I am at the present time in the process of tearing our organization limb from limb, and making an analysis. In this analysis I find, for instance, that our subscribers stay in hospital fourteen days for appendectomy. When they are paying the cost themselves, they stay in just a little better than ten days. In obstetrics they stay about fourteen days under our plan, whereas when paying for it themselves, they stay less than eleven days. These and many other factors must be taken into consideration in arriving at our final conclusions.

I do, however, feel that if the profession goes to work in earnest on this proposition, it will be possible to bring the cost down to such a level that employers and employes will find it to their advantage to join such an organization."

Question 19.—How do you handle night calls?

Answer.—We allow an additional dollar for calls made at night. The question of mileage is not our responsibility. We do not pay for transportation of the patient to the doctor, or the doctor to the patient.

Question 20.—In case your organization becomes bankrupt, what would you do, would there be any return of premiums to your subscribers?

Answer.—If we go insolvent, we are on the same basis as any other company. Our assets would be liquidated, and our debts paid in accordance with the amount of money available, after such liquidation. There would be no return of premiums to any subscriber. Our service is on a month-to-month basis only.

YOU ARE LUCKY TODAY

The last century was a period of unbelievable progress. But in no field was greater progress made than in care of the sick, and in advancing the standards of public health.

A century ago, for instance, anesthesia for surgical operation was unknown—it did not come into use until 1846. And even later, in Civil War days, hospital death rates of 20 per cent and more were not uncommon. Nothing was known of infectious diseases, the germ theory had not been heard of, and sterilization of instruments and dressings was never practiced. Not until 1868 was a start made in curbing and controlling infection.

Startling is the fact that 99 out of 100 American hospitals were founded within living memory. Fifty years ago hospitals were generally confined to large cities—in small towns and rural areas, operations took place at home, by the light of kerosene lamps and an open vessel steaming on a stove as sterilizer. The medical men were not content. It was due to their initiative that hospitals in smaller centers were gradually established.

The whole history of medicine is a history of individual effort—of tireless private initiative—of unselfish men fighting the endless war against disease and public ignorance. And all of us lead happier, fuller lives because of it.

A STUDY OF OSTEOPOROSIS BY MEANS OF CONTROLLED X-RAYS OF THE BONES

Part II.

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IN PREVIOUS articles,[1, 2] one of us (E. L. G.) has called attention to a group of patients with gastrointestinal complaints who had a definite osteoporosis of the bones (hand and wrist) when compared with normal subjects, and has outlined in detail the technique employed in determining the presence and severity of osteoporosis.

The present study concerns itself with a statistical analysis of two hundred and seven consecutive cases which were x-rayed in the manner previously referred to. In this analysis the X^2 method is used, X^2 being a measure of the total discrepancy between the observed frequencies and those calculated on the assumption that there is no association between the two variables. Therefore, the larger X^2 is, the greater the evidence of correlation. P is the probability that a value as large as the given X^2 would arise through sampling errors alone. When P is less than .05 (5 per cent) this is considered adequate evidence of the existence of real correlation between the two variables. The nature of the correlation (whether positive or negative) can be determined by inspection of the table.

For statistical purposes a slight change has been made in grading the osteoporosis from that described in the paper detailing the technique used in this work. Instead of dividing the series into those showing no osteoporosis, Grade I, Grade II, Grade III and Grade IV osteoporosis, we shall here simply refer to those showing no osteoporosis, slight osteoporosis, and definite osteoporosis. Slight osteoporosis corresponds to Grade I, while definite osteoporosis includes Grades II and III. There are no cases with Grade IV osteoporosis in this series.

Originally, the cases were divided according to the sex of the patient, there being fifty-eight males and one hundred and forty-nine females. Although the females showed a greater tendency toward increasing osteoporosis with advancing age than the males, the difference was found not to be significant statistically. It was therefore decided to study the group as a whole without reference to sex except in the case of those factors which concerned one sex only.

TABLE I

INCIDENCE OF OSTEOPOROSIS IN RELATION TO AGE

AGE		OSTEOPOROSIS NONE	OSTEOPOROSIS SLIGHT	OSTEOPOROSIS DEFINITE	TOTAL
10-49	O	48	35	39	122
	C	38.9	37.7	45.4	
50 & over	O	18	29	38	85
	C	27.1	26.3	31.6	
TOTAL		66	64	77	207

$X^2 = 7.85$ $P = .02$

In examining the tables, it will be noted that both the figures showing the observed incidence of osteoporosis and those showing the calculated incidence are included, the observed values being in heavy print opposite the letter O, and the calculated values in lighter print opposite the letter C. Values for X^2 and P are shown for each factor studied except in the case of occupation where the number of cases in one group is not large enough for this.

Table I shows the incidence of osteoporosis in the group as a whole, as well as a gross division according to age. There are sixty-six cases showing no osteoporosis, sixty-four slight osteoporosis, and seventy-seven definite osteoporosis. Of the normal group, only eighteen are over fifty years of age, showing a definitely decreasing presence of normal bones with age. This is borne out by the values for X^2 and P. However, the fairly large number of cases of definite osteoporosis (39) in the lower age group indicates that age is not the only factor. The group is not large enough to make a finer division into decades.

Table II shows the incidence of osteoporosis in relation to occupation. The types of occupations encountered in this group are similar to those

TABLE II

INCIDENCE OF OSTEOPOROSIS IN RELATION TO OCCUPATION

OCCUPATION	OSTEOPOROSIS			TOTAL
	NONE	SLIGHT	DEFINITE	
Manual labor	7	4	5	16
Housewives	24	25	44	93
Miscellaneous	35	35	28	98
TOTAL	66	64	77	207

TABLE III

FACTORS SHOWING NO RELATIONSHIP TO OSTEOPOROSIS

CIVIL STATE

CIVIL STATE	OSTEOPOROSIS			TOTAL
	NONE	SL'T	DEF.	
Single	♀ 20	23	19	62
	♂ 18.7	19.7	23.6	
Married	♀ 41	41	58	140
	♂ 42.3	44.3	53.4	
TOTAL	61	64	77	202
	X^2=2.23		P=.33	

PREGNANCIES

PREGNANCIES	OSTEOPOROSIS			TOTAL
	NONE	SL'T	DEF.	
None	♀ 23	29	27	79
	♂ 27.3	24.4	32.3	
One or more	♀ 19	17	34	70
	♂ 19.7	21.6	28.7	
TOTAL	42	46	61	149
	X^2=3.74		P=.135	

GASTRIC ACIDITY

GASTRIC ACIDITY	OSTEOPOROSIS			TOTAL
	NONE	SL'T	DEF.	
Absent to low free HCl	♀ 7	11	10	28
	♂ 8.9	11.6	7.5	
Normal to high HCl	♀ 13	15	7	35
	♂ 11.1	14.4	9.5	
TOTAL	20	26	17	63
	X^2=2.26		P=.368	

seen in any private office practice in a large urban community. It is essentially a "white collar" group. The miscellaneous column in this table can be considered the "white collar" workers. It was thought best to keep the housewives in a separate column. This group shows an increased incidence of osteoporosis. However, the small number of manual laborers makes statistical analysis impossible on the basis of occupation. Clinically, we have definitely gained the impression that there is a relatively decreased incidence of osteoporosis among manual laborers; that it is largely a disorder of the so-called "white collar" workers. This is borne out by our experience at the Minneapolis General Hospital, where perhaps the majority of patients are manual laborers of one type or another. Here it has been difficult to find cases for teaching purposes similar to our group showing osteoporosis.

TABLE IV

FACTORS SHOWING DEFINITE RELATIONSHIP TO OSTEOPOROSIS

CALCIUM INTAKE

CALCIUM INTAKE	OSTEOPOROSIS			TOTAL
	NONE	SL'T	DEF.	
Adequate	♀ 40	33	28	101
	♂ 32.2	31.2	37.6	
Inadequate	♀ 26	31	49	106
	♂ 33.8	32.8	39.4	
TOTAL	66	64	77	207
	X^2=8.6		P=.011	

BOWEL DISTURBANCES

BOWEL DISTURBANCES	OSTEOPOROSIS			TOTAL
	NONE	SL'T	DEF.	
None	♀ 54	34	30	118
	♂ 37.2	36.7	44.1	
Intestinal hypermotility	♀ 11	30	47	88
	♂ 27.8	27.3	32.9	
TOTAL	65	64	77	206
	X^2=28.81		P<.001	

CONDITION OF TEETH

CONDITION OF TEETH	OSTEOPOROSIS			TOTAL
	NONE	SL'T	DEF.	
Good	♀ 35	32	24	91
	♂ 29.0	28.1	33.9	
Fair to poor	♀ 31	32	53	116
	♂ 37.0	35.9	43.1	
TOTAL	66	64	77	207
	X^2=8.3		P=.018	

Table III is a composite table in which are included those factors studied which show no relationship to osteoporosis, namely, civil state, gastric acidity, and, surprisingly, pregnancies. Sixty-two of our patients were single; one hundred and forty married; data in this respect being incomplete in five cases. The low X^2, and P well above 5 per cent, shows a definite lack of correlation between civil state and osteoporosis. Gastric analyses were done in sixty-three cases. Here again a rather gross division is made, the group being divided between those showing absent to low free hydrochloric acid values and those with normal to high acid. Twenty degrees of acid is used as the dividing line. Many of those cases with low acid values showed acid only after histamine stimulation. No correlation with osteoporosis is seen. In regard to pregnancies, the women in the group are rather evenly divided between those having had no pregnancies (seventy-nine cases) and those having had one lation between a history of one or more pregnancies and osteoporosis is found. If the or more pregnancies (seventy cases). No correlation between a history of one or more pregnancies and osteoporosis is found. If the pregnancy group were further subdivided according to the number of pregnancies in each case, a correlation appears in those with four or more pregnancies, but the number is not large enough for proper statistical evaluation.

Table IV is again a composite table in which are included those factors studied which show a definite relationship to osteoporosis. In regard to the condition of the teeth, a simple division is made between those with obviously good teeth and

TABLE V

INCIDENCE OF OSTEOPOROSIS IN RELATION TO CALCIUM INTAKE AND BOWEL FUNCTION

BOWEL FUNCTION		OSTEOPOROSIS NONE	SLIGHT	DEFINITE	TOTAL
ADEQUATE CALCIUM INTAKE					
Normal	o	26	17	15	58
	c	15.3	10.0	18.3	43.6
Intestinal hypermotility	o	8	14	11	33
	c	12.7	13.4	15.3	41.4
TOTAL		34	31	26	91
INADEQUATE CALCIUM INTAKE					
Normal	o	23	14	13	50
	c	18.0	18.9	21.5	58.4
Intestinal hypermotility	o	4	19	34	57
	c	15.0	15.7	17.9	48.6
TOTAL		27	33	47	107

$X^2 = 40.5$ $P < .001$

Chart 1

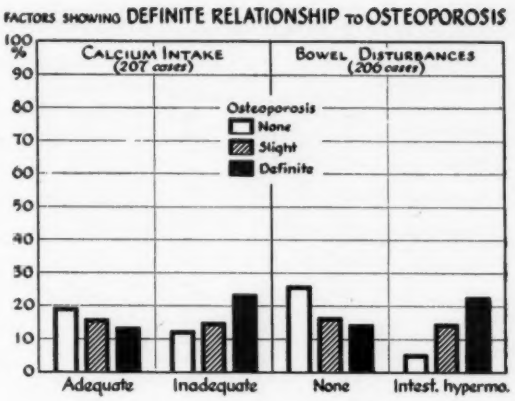
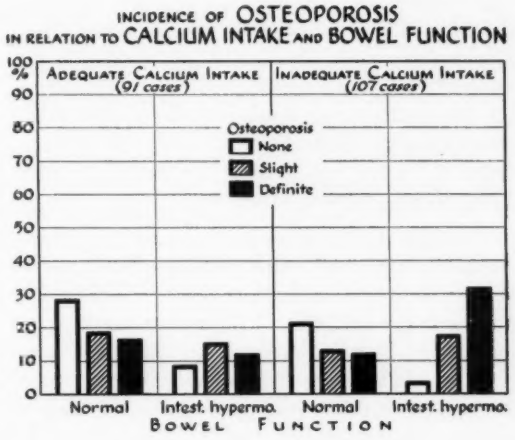


Chart 2



healthy gums with only minor dental repairs, and those with excessive dental repair, several to many teeth missing, partial or complete plates and obviously unhealthy gums. A very definite correlation is found between the condition of the teeth, so defined, and osteoporosis.

The criterion used to determine the adequacy or inadequacy of calcium intake was the history of whether or not the patient had over a long period of time consumed at least two to three glasses of milk and/or a considerable quantity of cheese daily. On this basis, a very definite correlation is seen between calcium intake and osteoporosis.

In studying the relationship between bowel function and osteoporosis, we have divided our cases into those with a history of normal bowel function with no symptoms or signs pointing to disturbed bowel function, and those with evidence of intestinal hypermotility. In the intestinal hypermotility group are included those with a history of chronic diarrhea, spastic constipation and cathartic habit. This is the so-called irritable bowel group. We believe there is adequate evidence to show that an intestinal hypermotility, especially of the small bowel, exists in these cases. Only one case of true constipation, that is, actual delay in the progress of the meal through the intestinal tract, was found in this series. This patient was later shown to have a partial obstruction due to bands of adhesions and is not included in this table. It is seen that a very marked correlation exists between bowel disturbances, as defined, and osteoporosis, P being less than 0.1 per cent.

Table V shows the effect of bowel function superimposed on that of calcium intake. In other words, the adequate and inadequate calcium intake groups are further broken down into those with normal bowel function and those with intestinal hypermotility. It is readily seen that intestinal hypermotility definitely increases the incidence of osteoporosis in the adequate calcium intake group, whereas normal bowel function decreases the incidence of osteoporosis in the inadequate calcium intake group. The best group (least osteoporosis) is that with adequate calcium intake and normal bowel function; the worst group (most osteoporosis) that with inadequate calcium intake and intestinal hypermotility. This arrangement of our data results in the highest value for X^2 encountered in this study; an extremely strong probability that bowel function when

TABLE VI

INCIDENCE OF OSTEOPOROSIS IN RELATION TO SYMPTOMS

SYMPTOMS		OSTEOPOROSIS			TOTAL
		NONE	SLIGHT	DEFINITE	
Nervousness	O	23	27	29	79
	C	25.2	24.4	29.4	X^2= .76 P=.64
Fatigue	O	18	24	33	75
	C	23.9	23.2	27.9	X^2=3.80 P=.135
Constipation	O	11	20	26	57
	C	18.2	17.6	21.2	X^2=5.88 P=.050
Abdominal pain	O	20	23	12	55
	C	17.5	17.0	20.5	X^2=8.17 P=.018
Muscle pains	O	19	19	16	54
	C	17.2	16.7	20.1	X^2=1.83 P=.368
Joint pains	O	14	10	17	41
	C	13.1	12.7	15.2	X^2=1.05 P=.607
Headache	O	7	12	10	29
	C	9.2	9.0	10.8	X^2=1.84 P=.368+
Gas distress	O	9	10	8	27
	C	8.6	8.4	10.0	X^2= .83 P=.04
Palpitation	O	9	6	8	23
	C	7.3	7.1	8.6	X^2= .68 P=.64

superimposed on calcium intake further affects the incidence of osteoporosis, P again being less than 0.1 per cent. The effect of calcium intake and intestinal hypermotility and their combination on the incidence of osteoporosis is illustrated graphically in Charts 1 and 2, in which the incidence of osteoporosis is given in percentages rather than in number of cases.

Table VI lists the symptoms most frequently encountered in this series of cases. No correlation is found to exist between any of these symptoms and the incidence of osteoporosis except in the case of constipation where a borderline positive correlation (P=5 per cent) is found and in the case of abdominal pain where a definitely negative correlation is found. The correlation between constipation and osteoporosis supports the previous finding of correlation between bowel function and osteoporosis, all but one case of constipation being of the spastic type. It is difficult to explain the negative correlation between abdominal pain and osteoporosis except for the fact that this series includes many cases of organic abdominal disease such as peptic ulcer and gall-bladder disease; and no attempt is made here to distinguish between types and locations of pain. A much larger series of cases would be required in order to sub-classify the various types of abdominal pain and discomfort.

Conclusions

In conclusion, it can be stated, therefore, that this study shows a definite, positive correlation between osteoporosis and age, condition of the teeth, calcium intake (as defined) and intestinal hypermotility (as defined). No correlation is found between osteoporosis and sex, civil state, gastric acidity and pregnancy. It might well be that a larger series of cases would bring out a correlation with one or more of these later factors. When the adequate and inadequate calcium intake groups are further subdivided according to bowel function, a further correlation with osteoporosis is found. Insufficient number of cases in the manual labor group makes statistical evaluation on the basis of occupation impossible. We believe, also, that we can conclude from this study that we have in this method a valuable measure of the calcium reserves of the body.

We are indebted to Dr. A. E. Treloar of the Division of Biostatistics, University of Minnesota, for guidance in the analysis of the data in this study.

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TUBERCULOSIS IN THE ARMY

Medical tests of Canadian army recruits are being sharpened to the point where today only about one out of 1,000 men develop tuberculosis after being accepted in the army. Since May, 1941, a total of 895 men have been discharged from the army because of pulmonary tuberculosis, but of that number 251 had served for several months before being x-rayed. —MAJOR G. T. ZUMSTEIN, Royal Canadian Army Med. Corps, *Bulletin Canadian Tuber. Assn.*, March, 1942.

TERATOMATOUS CHORIONEPITHELIOMA OF THE OVARY

Critical Review of Literature, With Report of a New Case

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THE presence of chorionepithelioma in testicular teratomata was described by Schlagenhaufer in 1902. He suggested that the chorionepithelioma was derived from the outer epithelial layer of fetal membranes. In the same year Kleinhans reported chorionepithelioma of the ovary which he believed to have followed an ovarian pregnancy. In 1904 Pick described the first case of ovarian teratoma containing chorionepithelioma. In using the term "teratoma" the terminology described by Robert Meyer will be followed.

The diagnosis of chorionepithelioma, whether it occurs after pregnancy or in a teratoma, is based on definite histological findings. Seitz lists the following findings that must be present:

1. Tumor is composed of both syncytium and Langhans cells.
2. Tumor cells are arranged in masses or cords with Langhans cells inside and the syncytium around the periphery.
3. Tumor has no connective tissue stroma of its own.
4. There is no vascular supply within the tumor.
5. The tumor cells grow toward, surround and penetrate maternal blood vessels.
6. There is coagulation of tissue, hemorrhage and necrosis.

Since the description of chorionepithelioma of the ovary without evidence of tumor in the uterus or tube by Kleinhans in 1902, forty-one other cases have appeared in the literature. Not all cases are alike, for it is apparent that there are two fundamental sources of chorionepithelioma of the ovary: (1) a pregnancy in the uterus, tube or ovary, (2) a teratoma.

There are three possibilities for the origin of the tumor following pregnancy:

1. Transportation of chorionepithelioma to the ovary from the uterus or tube followed by complete regression of the primary tumor.
2. Transportation of normal chorionepithelium to the ovary from the placental site of an intra-uterine or tubal pregnancy; the chorionepithelium then undergoes malignant degeneration at the new site.
3. Ovarian pregnancy.

That these three possibilities exist is easily understood, but to prove a single specific origin in the individual case is difficult. It is important, where site of origin is not clear, to study thoroughly the generative organs for evidence of primary tumor as Risel (1914) has done. In his case, a twenty-five year old woman who had had three previous pregnancies, the last eight months prior to operation, was found to have a hemorrhagic tumor of the right ovary which was histologically diagnosed chorionepithelioma. He found a small brown scar in the fundus of the uterus composed of a mass of clear granulation cells containing lipoid, blood pigment and showing destruction of elastic fibers in the uterine muscle and vessels. He considered the area as a remnant of a primary tumor which had followed the previous pregnancy and had undergone regression.

Chorionepithelioma of the ovary occurring in the mature, nonvirginal woman is best considered of placental origin in the absence of teratomatous findings. Although the patient's last pregnancy may have been many years before, it is always possible that a new and unsuspected pregnancy may have intervened. Some authorities believe the tumor tissue may have a long latent period before the appearance of clinical symptoms, thus explaining the apparent non-relationship to a past pregnancy. The origin of tumors occurring in the virgin is indefinite unless other tissues characteristic of teratoma are found, such as glia, cartilage, or muscle.

Pure chorionepithelioma of the ovary without evidence of primary tumor elsewhere may represent an overgrowth of chorionepithelioma with the destruction of the other teratomatous tissue, or it may represent primarily an exclusive development of special teratomatous cells. In the

case described by Bettinger (1932), a seven year old child was operated upon for the removal of an ovarian tumor composed of masses of Langhans cells and syncytium, with large areas of hemorrhage and necrosis. Thorough examination of the tumor failed to reveal other teratomatous constituents. It represented a teratoma since the remote possibility of pregnancy may be ignored. Similar cases in children have been reported by Read (1928) and Tscherne and Schaffer (1939).

In the adult, chorionepithelioma of the ovary can only be proven teratomatous if other tissues characteristic of teratoma are found. Even then it is theoretically possible for teratoma and pregnancy to be combined. When pure chorionepithelioma of the ovary occurs in the adult, one should carefully search uterus and tube for evidence of primary tumor or placental site and only then consider the remote possibility of the very infrequent teratoma. Only twelve proven teratomatous chorionepitheliomata of the ovary are known. Eight occurred in children before puberty and three of these failed to reveal other teratomatous elements.

The presence of chorionic villi in a chorionepithelioma of the ovary is good evidence that the tumor did not arise in a teratoma. Chorionepithelioma of the ovary containing villi has been reported by Dougal (1924) and Sunde (1922): both cases were considered of placental origin. Theoretically, villi could occur in the teratoma if embryonal mesenchyme were present and could form an adequate stroma for the villi and, secondly, if blood vessels were present, within which the villi might advance. However, in spite of advanced embryological structures, as umbilical cord, occurring in teratomata, normal placental tissue has never been reported. Pick (1904) described a case which he believed represented a dermoid cyst with hydatidiform mole. A thirty year old woman had a dermoid cyst and a tube in which pregnancy had occurred removed from the same side. The isthmic portion of the tube was enlarged to the size of a walnut and contained placental tissue. The dermoid cyst had a separate cystic area toward the tubal pole; the cyst had a smooth lining and contained serous fluid and a papillary structure composed of grape-like vesicles, partly necrotic and partly swollen and presenting marked regressive changes. He believed the structure represented a hydatidiform mole which may have arisen from the tubal pregnancy or from the teratoma. That it originated from the teratoma is unlikely since the structure was in a cyst separate from the main mass. From the description it was more likely a cystoma papillomatosum in degeneration.

Chorionepithelioma of the ovary in childhood is manifested by precocious sexual development and uterine bleeding. In the adult the usual complaint is irregular vaginal bleeding, suggesting a diagnosis of ectopic pregnancy. There is usually some abdominal distress and often a palpable mass. The Aschheim-Zondek and Friedman tests are positive. In the child, the positive pregnancy test is sufficient to make a diagnosis of teratomatous chorionepithelioma. Fasold (1931) reported a case of a child eight years old, who presented precocious sexual development. The Aschheim-Zondek test was positive. A tumor mass occupied the right adnexal region. A portion of a small nodule in the neck was removed for biopsy and revealed tissue similar to chorionepithelioma. No further operation was performed nor was an autopsy subsequently done. A diagnosis of chorionepithelioma of teratomatous origin seems unquestionable because of the patient's age and the positive pregnancy reaction.

Several types of ovarian tumor, in the course of their growth, may undergo changes in morphology as a result of varying conditions within the tumor and simulate chorionepithelioma by the development of nonspecific syncytium. This phenomenon has evoked speculation over a third possible origin of chorionepithelioma of the ovary. However, similar changes of carcinoma cells into syncytial masses when they are in contact with blood are known to occur in organs other than the ovary. It is, therefore, confusing to classify ovarian tumors having these structures with chorionepithelioma originating in a teratoma or after a pregnancy as Miller has done in the Henke-Lubarsch handbook of pathology. The phenomenon has no relationship to chorionepithelioma and is only mentioned to avoid diagnostic error. It is valuable, in this respect, to describe cases in which the diagnosis or the appearance of the tumor is deceptive.

Ovarian tumors containing cells resembling Langhans cells and syncytium have been reported by Michel (1905), Niosi (1905), Schmaus

(1906), Fergue and Massabuau (1913), Bock (1924), Klaften (1934) and others. Michel described a case of a sixteen-year-old virgin who was operated upon for an ovarian tumor which was diagnosed alveolar carcinoma. Two and a half years later the girl died of recurrence. At autopsy, the entire abdomen was filled with tumor of pithy consistency and rich vascular supply. The tumor varied in color from gray to dark black. The gray areas presented the alveolar carcinoma structure while the darker areas and the metastases contained massive areas of hemorrhage and fibrin meshwork. Around the margins of the hemorrhagic areas were masses of clear, sharply circumscribed cells resembling Langhans cells, as well as darker colored masses of syncytium containing many nuclei. There were no other findings to suggest teratoma. Michel interpreted these findings as secondary and stated that one should be cautious in the diagnosis of chorionepithelioma of the ovary because carcinoma cells in contact with blood may form very similar syncytium.

A case described by Bock (1924) differed from Michel's case in that the original tumor presented a picture resembling chorionepithelioma. A thirteen year old virgin was found at laparotomy to have an inoperable tumor of the right ovary. The tumor was nodular and varied in color from white to dark red. Microscopical examination of the larger nodules revealed large, solid masses of carcinoma. In the hemorrhagic and necrotic areas between masses of carcinoma were nests of small, differentiated cells resembling Langhans cells surrounded by masses of protoplasm containing many nuclei. There were no other forms of tissue in the specimen to suggest teratoma. Again, the chorionepithelioma-like picture occurred in an ovarian carcinoma only where the cells were in contact with blood.

Schmaus (1908) described a similar ovarian tumor occurring in a child of fifteen years. At laparotomy a large left ovarian cyst was removed. Inside the cyst was a solid white nodule with a few hemorrhagic areas scattered through the tissue. The tumor was an adenocarcinoma. In the hemorrhagic areas and in the metastases, masses of clear cells covered by syncytium were found.

Klaften (1934) described in an eleven year old child a tumor which presented a problem of differential diagnosis. The major portion of the tumor was composed of round darkly staining cells similar to granulosa cells. Other areas presented masses of smaller cells surrounded by syncytium. The diagnosis could have been (1) granulosa cell tumor with rich plasmodium formation similar to that in chorionepithelioma, (2) teratoma, or (3) a collision of teratoma and granulosa cell tumor. A diagnosis of teratoma was made after careful examination disclosed adenomatous structures similar to pseudomucinous cystoma and intestinal epithelium. Because of the connective tissue formation and new blood vessels in the tumor, the areas suggesting chorionepithelioma were considered only plasmodium formation.

TABLE I. AUTHORS OF PREVIOUS PUBLICATIONS ON CHORIONEPITHELIOMA OF OVARY, GROUPED ACCORDING TO PROBABLE ORIGINS OF THE TUMORS.

Primary or Teratomatous		Following Pregnancy		Indefinite	
Pick, L.	1904	Kleinhans, F.	1902	Lubarsch, O.	1904
Albrecht, H.	1913	Iwase, Y.	1908	Glinski and Rosner	1905
Read, C.	1928	Iwase, Y.	1908	Miller, F.	1914
Freund, E.	1929	Fairbairn, J.	1909	Bollag, W.	1916
Fasold, H.	1931	Klotz, R.	1913	Kynoch, J.	1919
Bettinger, H.	1932	Kedrierski, A.	1913	Chisholm, J.	1920
Siegmund, H.	1932	Risel, W.	1914	Rohdenburg, G.	1926
Fikentscher, R.	1937	Ries, E.	1915	Varo, B.	1929
Tscherne and Schaffer	1939	Frank, R.	1916	Varo, B.	1929
Sbarcea, J.	1939	Seitz, A.	1916	Simard, L.	1931
Oda, Matsushite, and Kurosu	1940	Phillips, M.	1920	Simard, L.	1937
Backus, and Griffin	1941	Sunde, A.	1922	Maki and Takeda	1931
Author's case	1941	Dougal, D.	1924		
		Voigt, G.	1925		
		von Zalka, E.	1928		
		Preston, and Goy	1937		
		Peters, F.	1940		

Since the origin of chorionepithelioma of the ovary is of great interest, an attempt has been made to sort out all cases reported in the literature and assign to them the most likely origin, where this has not already been done. As mentioned, Risel considered his case a primary uterine chorionepithelioma which, after metastasizing to the ovary, underwent spontaneous regression. Kleinhaus (1902) attributed his to an ovarian pregnancy. Tumors reported by Iwase (1908), Ries (1914), Voigt (1925), Simard (1931) and Peters (1940) all occurred in women in the late childbearing age with histories of previous pregnancies. Fairbairn (1909), Klotz (1913), Kedrierski (1913), Frank (1916), Seitz

(1916), Phillips (1920), Sunde (1922), Dougal (1924), Zalka (1926) and Preston (1937) have reported the finding of chorionepithelioma in the ovary without evidence of a primary tumor in the uterus or tube. These tumors occurred in women between twenty-one and thirty-one years of age who had histories of recent pregnancies or periods of amenorrhea followed by vaginal bleeding. In this group, Klotz found structures similar to villi in blood vessels. Dougal and Sunde found definite villi in their tumors.

Simard (1937) described a case occurring in a virgin seventeen years of age. Maki and Takeda (1931), Glinski and Rosner (1905) and Varo (1929) have also reported similar cases in virgins from seventeen to twenty-seven years of age. In these cases no definite teratomatous tissue was mentioned. That they may have arisen in teratomata can be neither denied nor proven. Kynoch (1919) reported a case of chorionepithelioma occurring in a twenty-four year old nullipara. The patient complained of irregular vaginal bleeding prior to operation which suggests pregnancy but the case is not decisive. The presence of chorionepithelioma in the ovary is mentioned by Rohdenburg (1926) and Chisholm (1920) but the information is not sufficient to draw conclusions. F. Miller (1914) reports a case in which the primary tumor was grossly diagnosed sarcoma and in a recurrence chorionepithelioma was found. Since the original tumor was not examined histologically, it is impossible to determine the exact type it represented, but its occurrence in a virgin of seventeen suggests that it may have been of teratomatous origin. Bollag (1916) described a tumor of the ovary occurring in a nineteen year old virgin in which the predominant tumor element was chorionepithelioma while other areas demonstrated sarcoma. This tumor may have been a teratoma, but the description is not clear. Lubarsch (1904) (quoted by Pick) diagnosed chorionepithelioma from a biopsy taken from a pelvic tumor involving the entire pelvis of a thirteen year old child. Because of the extent of the tumor, it was impossible to determine the original site, and no autopsy was done. On the basis of age alone, it might be assumed that the tumor was an ovarian teratoma.

Since Pick's description of the first teratomatous chorionepithelioma of the ovary, eleven other conclusive cases have been reported in the literature. To this group we add one new case.

Case 1.—Pick (1904). Child nine years of age admitted to the hospital because of abdominal enlargement. At laparotomy a teratoma of the ovary was removed. The tumor was composed of the usual teratomatous structures in addition to chorionepithelioma identical histologically with that found in tumors of the uterus after pregnancy. The patient died several weeks later.

Case 2.—Albrecht (1913). Virgin eighteen years of age from whom a tumor of the right ovary the size of a child's head was removed. The tumor was mostly necrotic and contained numerous hemorrhagic areas. The tissue showed the usual histological picture of chorionepithelioma. The patient died of metastases.

Case 3.—Read (1928). Child eleven years of age admitted to the hospital because of slight vaginal bleeding. She developed pain in the abdomen. At laparotomy a right ovarian tumor on a pedicle was found. Several twists in the pedicle accounted for the pain. The tumor was coursely lobulated and had an intact capsule. On section the tumor was firm and elastic and contained several cystic spaces filled with clear fluid and blood. On histologic examination only typical chorionepithelioma was found. The uterus and tubes were normal. Patient died of metastases one month after operation.

Case 4.—Freund (1929). Child seven years of age admitted to hospital because of pain in the abdomen. At laparotomy a tumor was found arising from the right ovary. On section, the tumor was composed of white-gray and dark red hemorrhagic areas. On microscopic examination, the dark red areas were typical chorionepithelioma, the white-gray areas contained cartilage, bowel, smooth muscle, nervous tissue and squamous epithelium. The patient died.

Case 5.—Fasold (1931). Child eight years of age admitted to the hospital because of vaginal bleeding associated with precocious sexual development. The Aschheim-Zondek test was positive. A tumor was felt in the region of the right ovary. Biopsy of a nodule in the neck revealed chorionepithelioma. No operation or autopsy was done, but in view of the positive pregnancy test and the age of the patient, the diagnosis is clear. Patient died.

Case 6.—Bettinger (1932). Child seven years of age admitted to the hospital because of pain in the pelvis associated with general malaise and weight loss. There was precocious development of the breasts. At laparotomy a tumor the size of a fist was removed from the right adnexal region. Histological examination revealed large masses of necrosis and hemorrhage and in better preserved areas, chorionepithelioma. No other teratomatous tissue found. Because of the patient's age the diagnosis is clear. The patient died.

Case 7.—Siegmund (1932). Child six years of age admitted to the hospital with a history of precocious

development of the breasts, external and internal genitalia, and the appearance of vaginal bleeding. Aschheim-Zondek test was positive. A tumor was removed from the left adnexal region which, on section, varied in appearance; some areas were solid, others cystic. The tumor was gray-red in color with scattered black areas. Glial tissue, squamous epithelium and cysts lined by cylindrical epithelium were found on histological examination. Areas composed of masses of Langhans cells covered by syncytium were described. At autopsy the diagnosis was definitely established. All the metastases contained pure chorionepithelioma.

Case 8.—Fikentscher (1937). Child fourteen years of age admitted to the hospital complaining of vaginal bleeding. A tumor the size of a man's fist was removed along with a nodule in the omentum. On section the tumor showed extensive hemorrhagic infarction. There were two parts of the tumor, one composed of typical structures of teratoma and another of typical chorionepithelioma. The nodule in the omentum was also chorionepithelioma. The Aschheim-Zondek test was positive after surgery. Patient ultimately expired with metastases. Chorionepithelioma was present in all metastases.

Case 9.—Tscherne and Schaffer (1939). Child eight years of age admitted to the hospital with a history of vaginal bleeding for five months, increase in the size of the breasts, and growth of hair about the genitalia. The Aschheim-Zondek test was positive. A large tumor involving the uterus was removed. Section of the tumor showed it to be brown-red in color and very friable. Microscopically the tumor was typical chorionepithelioma. There were no teratomatous areas mentioned. Patient died with metastases.

Case 10.—Sbarcea (1939). Woman twenty-seven years of age admitted to the hospital with a history of vaginal bleeding for ten months. The Aschheim-Zondek test was positive. At laparotomy a left ovarian tumor the size of a man's head was removed. The rest of the generative tract was normal. The tumor was composed of cartilage, smooth muscle, glia, pseudomucinous cysts and squamous epithelium. Typical chorionepithelioma was found in the hemorrhagic and necrotic areas. Eight days after operation the Aschheim-Zondek test was positive. Patient died and at autopsy all metastases were chorionepithelioma.

Case 11.—Oda, Matsushita, Kurosu (1940). Child eleven and one-half years of age admitted to the hospital complaining of mass in abdomen. There were no other symptoms. A right ovarian tumor the size of a fist was removed. The tumor was nodular, with gray and bloody areas. The tumor was composed of chorionepithelioma and other teratomatous elements including cartilage, cysts and tubules lined by columnar epithelium, squamous epithelium and muscle. Two subsequent operations were performed. Each specimen showed chorionepithelioma. Child expired after the third operation.

Case 12.—Backus, G. R., and E. P. Griffin, Jr. (1941). Child thirteen years of age was admitted to the hospital complaining of right lower quadrant pain. At laparotomy a right ovarian tumor the size of an orange was removed. The tumor had a firm, intact capsule. Grossly the tissue was hemorrhagic; microscopically, it was composed of typical Langhans and syncytial cells. No other teratomatous elements reported. The tubes and uterus were normal. Twelve days after operation the Friedman test was positive. The child died six months later. At autopsy numerous metastases composed of chorionepithelioma were found. The uterus and tubes were free of tumor. Because of the patient's age, the absence of the menarche, the intact hymen and the positive Friedman test, a diagnosis of teratomatous chorionepithelioma is acceptable.

Author's New Case of Teratomatous Chorionepithelioma of the Ovary

Mrs. L. M., aged nineteen, no pregnancies. Menstrual periods began at the age of fifteen and were regular until one year prior to operation, when periodicity was lost and duration of bleeding prolonged. The patient bled from March 14 to March 21, 1940, from March 31 to April 9, from May 2 to May 9, from May 17 to May 22 and from June 17, 1940, to the time of curettage on July 6, 1940. At the time of curettage a definite mass was felt in the left adnexal region. A diagnosis of ectopic pregnancy was made.

Laparotomy was performed on July 8, 1940, for removal of a mass measuring eight centimeters in diameter from the region of the left ovary. The tube was not involved. The postoperative course was uneventful. Sixteen days after the operation the patient developed pain in the left lower quadrant and shortly thereafter a mass was noted. Vaginal bleeding recurred. A second operation was carried out on August 29, 1940, at which time a hemorrhagic mass ten centimeters in diameter was removed from the left broad ligament. The tumor had extended to the body of the uterus and the latter also was removed. The right ovary and tube were left in situ. Six weeks after the second operation the Friedman test was positive. The patient was given deep x-ray therapy to the abdomen postoperatively and to the chest after metastases were demonstrated. The patient expired eight months after operation with cerebral metastases. Autopsy permission was not granted.

Surgical specimens were examined through the courtesy of Dr. Louis Roberts.

Description of the Specimens

1. *First Operative Specimen.*—Macroscopically: A round ovarian tumor eight centimeters in diameter, with a thin smooth walled capsule which was gray in the thicker areas and dark colored in the thinner, more transparent areas. There were small pebble-like elevations on the surface. On gross section the tumor was dark red to black with a very narrow peripheral zone of gray best seen near the hilum of the ovary. A few strands or septa from the capsule extended a short distance into the tumor substance. Several small

smooth-walled cysts filled with thin serous fluid were present in the gray areas.

Microscopically: The primary tumor contained ovarian stroma with areas of well preserved cortex, in which there were numerous normal primordial follicles. The surface epithelium dipped into the cortex and formed deep clefts. A developing follicle in the same area demonstrated granulosa cell layer five or six cells thicks and a theca layer four or five cells thick. The theca cells stained more clearly and had larger nuclei. A second follicle in regression had a granulosa layer two cells thick, the nuclei of which were arranged in antipodal manner, with the outer row of nuclei toward the theca and the inner row of nuclei toward the lumen. The theca cells were proliferating. There was also an atretic follicle in which the granulosa appeared as an interrupted cord or darkly stained cells lying in the center of a fibrous and hyaline membrane which in turn was covered by a zone of proliferating theca cells.

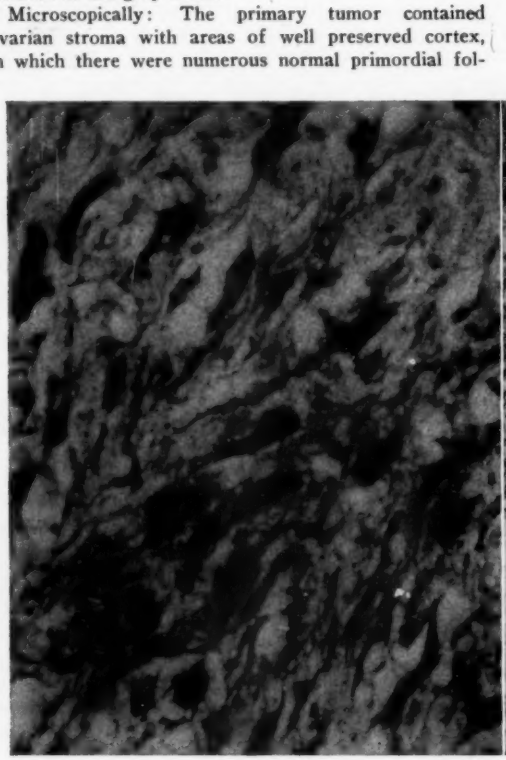

Fig. 1.

Fig. 2.

Masses and cords of lutein cells were scattered through the cortex. Some clusters of these cells were better preserved than others. These were luteinized theca cells, large, round and rich in cytoplasm with large, round nuclei. Some cells showed vacuolization of the cytoplasm and pyknosis of the nuclei. One large mass of cells had a cavity and immediately about the cavity were smaller, less luteinized theca cells.

Near the surface, and in one instance elevating the surface were small, sharply circumscribed nodules of decidua-like cells. The cells were large, clear cells with distinct cellular outline. The cytoplasm was abundant and slightly basophilic. The nuclei were large and round to oblong in shape with clear staining nucleoli. Scattered through the decidua-like cells were smaller fibrocytes and fine collagen fibrils. Many larger cells showed degeneration, irregular cell outline, pyknosis or absence of the nuclei. A few cells were scattered along the surface of the ovary.

Glial tissue was present in immediate contact with the ovarian stroma. In better preserved areas there were typical forms of neuroglia, the astrocyte with long smooth unbranched fibers and irregular cell outline, and the smaller cells with less distinct cellular processes, the oligodendroglia (Fig. 1). Within the glial tissue were several small cysts lined by squamous epithelium. In one the cyst wall had been partly destroyed and filled with necrotic tissue from the chorionepithelioma. It contained three small bodies made up of concentric rings of hyaline material. A layer of squamous epithelium could be recognized about one of the bodies. These appeared to be cholesteatomata (Fig. 2). A second cyst lined by squamous epithelium was surrounded by a wide zone of tissue very rich in collagen fibrils. Farther from the cyst the tissue assumed the normal appearance of glial tissue.

One cyst, recognized grossly, was lined by a single layer of tall columnar epithelium similar to that in pseudo-mucinous cystoma. The cells varied from tall columnar to very low cuboidal. At one point the epithelium dipped into the connective tissue to form a gland. In the immediate vicinity were other tubular

or glandular structures lined by similar columnar epithelium. Parts of the cyst epithelium and glands were necrotic. In another area of the teratoma were adenomatous masses of the same tissue. The cells were arranged in a tubular manner separated by fine connective tissue septa (Figs. 3, 3a). In the necrotic areas of this tissue were large masses of lymphocytes.

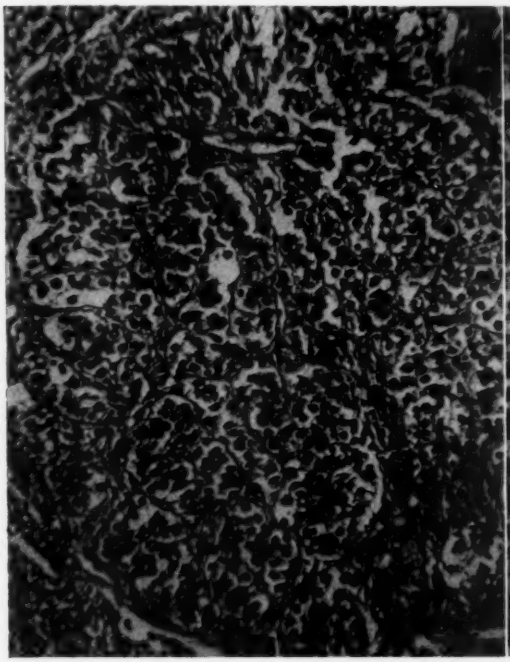

Fig. 3.

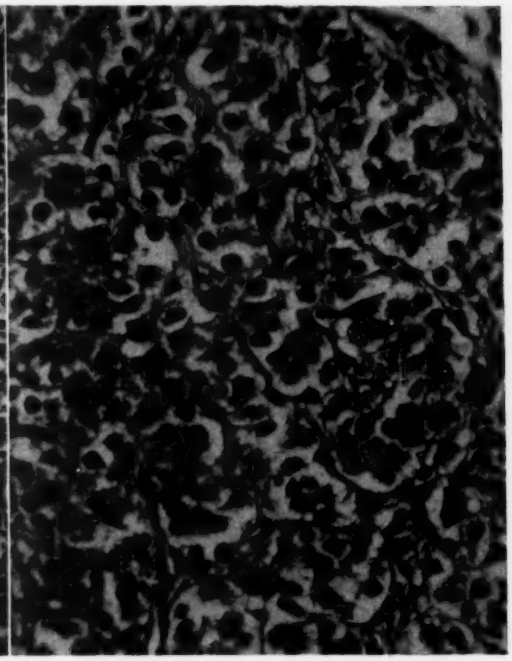

Fig. 3a.

Sections of the hemorrhagic tumor tissue revealed masses and cords of polygonal, almost round cells varying widely in size. The cytoplasm was clear, the nuclei round. Larger cells had more distinct cell outlines. Where these cells were in contact with blood and plasma, syncytial cells had developed. In the same areas transitional stages could also be seen (Fig. 4). The syncytium appeared as a thin line or strip of tissue containing numerous dark staining irregularly shaped nuclei and was situated along the surface of masses of Langhans cells where they were in contact with blood (Fig. 5). Some areas showed masses of cytoplasm containing many darkly stained nuclei of various shapes. Regression and necrosis of the chorionepithelioma could be seen where the tissue was unable to obtain sufficient nourishment to survive. In one area, the chorionepithelioma was invading glial tissue. At the junction of the two, the invaded tissue and chorionepithelioma had reacted by coagulation.

The chorionic cells also invaded the adenomatous structures previously described (Figs. 3, 3a). Here only large isolated cells with irregularly shaped darkly stained nuclei were seen, some of which were multinucleated. There was a heavy infiltration of lymphocytes in this area.

2. *Second Operative Specimen.*—Macroscopically: Recurrent tumor and uterus. The recurrent mass occupied the region of the left tube and broad ligament. The tumor tissue had extended to and involved the left lateral wall of the uterine corpus and had covered almost half of the upper surface of the fundus. The tumor invaded the uterine wall in nodular manner but did not involve the cavity. The uterine cavity was smooth and presented no abnormal findings. The cervical os was patent. The left tube was adherent to the mass on the posterior surface. The tubal lumen could be identified and was patent, without evidence of tumor involvement. The right tube and ovary were missing. The tumor mass was irregular in outline and measured 9x6.5x4 centimeters. The basal part of the tumor was irregularly ragged and friable with dark red to black color. The upper part of the tumor was smooth and covered by a thin connective tissue capsule. A strand of omentum was adherent to the posterior and lateral surfaces of the mass. Within the omental tissue was a nodule of hemorrhagic and necrotic tissue grossly similar to the main tumor tissue.

Microscopically: Sections taken from the recurrent mass revealed typical masses and strands of Langhans and syncytial cells. Sections of the uterus where the tumor was adherent showed invasion and replacement of the outer layers of the musculature by the chorion-

epithelioma. The inner layers of the myometrium and the endometrium were not involved. Although the tube was surrounded by tumor tissue, its musculature and mucosa were not invaded. There were no other teratomatous constituents found in the recurrent tumor. The diagnosis was, then, primary chorionepithelioma arising in a teratoma of the ovary.

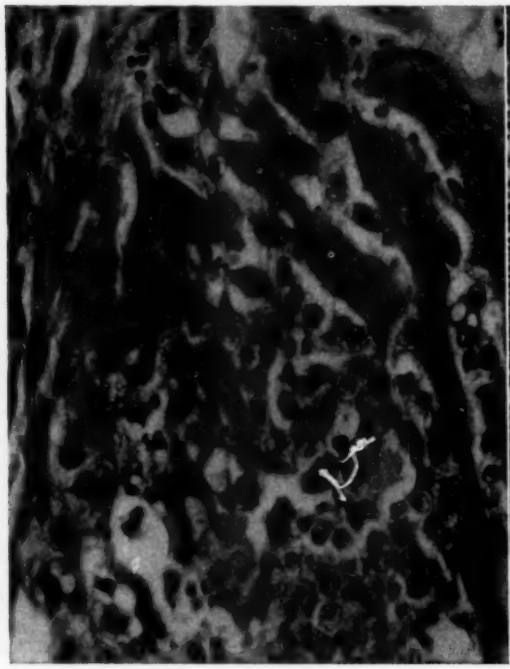

Fig. 4.

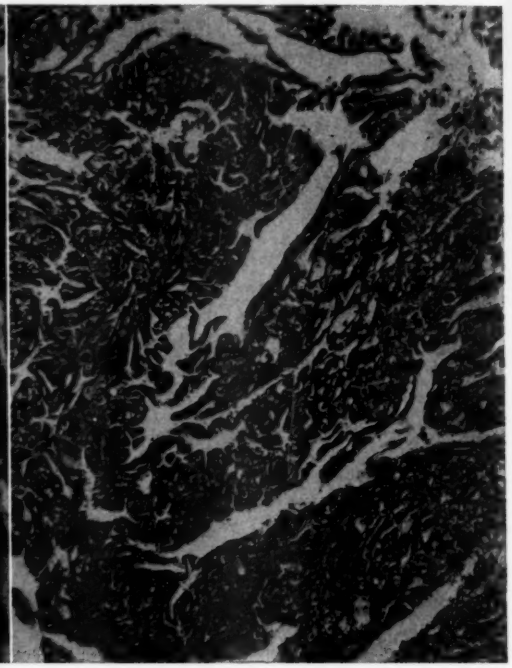

Fig. 5.

Summary

Chorionepithelioma of the ovary without evidence of primary tumor elsewhere may arise following a pregnancy or as a part of a teratoma.

The diagnosis of teratomatous chorionepithelioma demands the finding of other teratomatous constituents in the mature individual. This is most often not necessary in the prepubertal child.

Symplasmatic changes of carcinoma tumor cells in contact with blood must not be called chorionepithelioma since this term implies origin of the tumor from ectoblastic cells. The term pseudo-chorionepithelioma is acceptable.

A review of the literature dealing with chorionepithelioma of the ovary revealed twelve definite cases of teratomatous chorionepithelioma of the ovary to which has been added one new case of teratoma with chorionepithelioma of the ovary occurring in a nineteen-year-old woman who had never been pregnant.

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INTERAURICULAR SEPTAL DEFECT

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SLIGHT patency of the foramen ovale or an opening of sufficient size to permit passage of a probe is the commonest of all congenital cardiac defects, the incidence, according to Patten, being approximately 25 per cent. This defect is merely a slight variation from the normal development and is of no clinical importance except in some cases of terminal myocardial failure with increased pressure in the right auricle, a condition under which it may give rise to paradoxical embolism or to terminal cyanosis. Defects 1 cm. in diameter or larger in the interauricular septum are real congenital malformations rarely diagnosed clinically and found infrequently at postmortem examination. Four cases have been reported previously from the Mayo Clinic, Amberg and Willius having reported the first one in 1926. In 1936 Erickson and Willius presented another case, and in 1937 Ingham[9,10] discussed in detail two additional cases.

In 1934 Roesler made a complete review of the literature on this subject and reported one case of his own. In 1940 one of us (Tinney) reviewed the literature since Roesler's article and reported two new cases, making the total number of cases reported eighty-six. Practically all of the clinical and pathologic features typical of interauricular septal defect were well illustrated by the four cases which are reported herewith; the first two cases demonstrated several interesting complications.

Report of Cases

Case 1.—A man fifty years old was admitted to the Mayo Clinic, September 14, 1941, complaining of edema and a rapidly beating heart. In 1925 he had experienced his first attack of tachycardia, which started abruptly, lasted fifteen minutes and stopped suddenly. During the next six years he had had five similar attacks. In 1931 he experienced the first

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Fig. 1. Interauricular septal defect; marked dilatation of the right auricle and ventricle.

Fig. 2. Dilatation of the right ventricle and pulmonary valve.

spell of tachycardia that lasted five hours. At that time roentgen-ray examination revealed cardiac enlargement. Since then the patient had had a similar attack every one to twelve weeks, lasting from thirty minutes to fifteen hours. With each one of these attacks he became severely dyspneic, and the tachycardia always left him with a feeling of epigastric fullness. He took digitalis periodically from 1931 to 1936, when it was discontinued because he was said to have an "incomplete heart block" as a result of the drug. Since 1932 he had taken at least 6 grains (0.4 gm.) of quinidine daily and since June, 1941, he had taken from 20 to 30 grains (1.3 to 2 gm.) daily. In May, 1941, the attacks had become more frequent and prolonged. During the two months prior to admission, auricular fibrillation had been present constantly, dyspnea had been severe, and the patient had noticed gradually increasing edema of the ankles and puffiness under the eyes.

Examination at the clinic revealed marked edema of the extremities, moderate dyspnea, and râles at the bases of both lungs. The left border of the heart was 2 cm. to the left of the midclavicular line. The cardiac sounds were of poor quality and of variable intensity. There was a sharp first sound at the apex, with obliteration of the second sound. The pulse was rapid, unequal, and irregular. The blood pressure measured in millimeters of mercury was 108 systolic and 82 diastolic. The abdomen was distended with moderate ascites, and the liver was palpable to four fingerbreadths below the costal margin.

The electrocardiogram disclosed a rate of 131, auricular fibrillation, and impaired ventricular conduction. A roentgen-ray examination of the thorax revealed marked widening of the right and left borders of the heart and pulmonary congestion.

The clinical diagnosis was chronic mitral endocarditis with stenosis and regurgitation, paroxysmal auricular fibrillation and congestive heart failure.

The patient was treated with salyrgan, digitalis, and quinidine and appeared to be doing very well when he died suddenly, September 23, 1941.

At postmortem examination the peritoneal cavity contained 150 c.c. of clear yellow fluid. The hepatic margin extended 9.5 cm. below the xiphoid cartilage and 2.5 cm. below the right costal margin. Each pleural cavity contained 500 c.c. of clear yellow fluid. The transverse pericardium measured 22.5 cm., and the pericardial sac contained 300 c.c. of clear, dark yellow fluid. The heart weighed 735 gm. (Figs. 1 and 2). There were two "soldiers' spots" at the left side of the base posteriorly, each measuring 3 mm. in diameter. The right auricle and ventricle were markedly dilated and hypertrophied. The left auricle and ventricle also were dilated, but there was no hypertrophy. The interauricular septum was absent, the opening measuring 5.5 cm. in diameter. Near the base of this septal defect there was a small band separating the opening into two apertures, the larger one measuring 5 cm. in diameter and the smaller one 1.5 cm. in diameter. There was dilatation, grade 3, of the rings of the pulmonic valve, tricuspid valve, and pulmonary artery. The pulmonic valve also was thickened. The mitral valve was thickened, the edges were curled under, and the chordae tendineae were thickened and shortened. In the left auricle there were numerous subepicardial hemorrhagic spots 2 cm. in diameter. There was slight sclerosis of the coronary arteries. The diameters of the cardiac valves were as follows: aortic valve, 7.3 cm.; mitral valve, 9.3 cm.; tricuspid valve, 15 cm. and pulmonic valve 11.5 cm. The depth of the left ventricle was 10.2 cm., the thickness of the wall of the ventricle 1.3 cm.; the depth of the right ventricle was 16.5 cm. and the thickness of the ventricular wall 0.6 cm.

Comment.—This case is interesting because the congenital lesion was complicated by mitral

stenosis, regurgitation, and auricular fibrillation. Interauricular septal defect is the only congenital cardiac lesion frequently associated with mitral endocarditis or auricular fibrillation. Because of the presence of mitral stenosis this case is an example of the so-called Lutembacher's disease.

Case 2.—A man aged thirty-six years was admitted to the clinic September 10, 1938, because of abdominal symptoms which proved to be unrelated to the cardiovascular system. He did not give a history of rheumatic fever, but stated that since the age of two years he had been known to have a heart murmur. For one month prior to admission he had noticed dyspnea on very slight exertion and edema of the ankles that had necessitated cutting his slippers.

Examination revealed that the blood pressure measured in millimeters of mercury was 128 systolic and 90 diastolic and the pulse rate was 96 beats per minute. The heart was enlarged, the rhythm regular, and there was a rough systolic murmur at the apex transmitted to the axilla. The liver was enlarged moderately. Roentgenographic and roentgenoscopic examinations of the thorax revealed cardiac enlargement, prominence of the pulmonary conus, and passive congestion. A clinical diagnosis of rheumatic endocarditis was made. The patient was dismissed October 27, 1938, in good condition.

November 15, 1938, the patient began to have daily fever of 0.5° F. with generalized aching pains. In December, 1938, he experienced severe episodes of chills and a temperature of 103° F.; these episodes recurred every four or five days. February 13, 1939, the patient returned to the clinic acutely ill with râles at the bases of both lungs and marked edema of both ankles. The heart was very large, the rate 120, and rhythm regular. Urinalysis revealed albumin grade 1, occasional granular casts and erythrocytes. The concentration of hemoglobin was 8.7 gm. per 100 c.c. of blood and erythrocytes numbered 3,020,000 and leukocytes 9,000 per cubic millimeter.

A clinical diagnosis of congenital heart disease with subacute bacterial endocarditis was made.

February 18, 1939, a blood culture showed green-producing streptococci, four colonies per cubic centimeter of blood. In spite of digitalization dyspnea and edema rapidly became worse. Orthopnea and ascites developed, the patient became disoriented and died suddenly February 19, 1939.

At postmortem examination the right and left pleural cavities each contained 500 c.c. of cloudy, straw-colored, fibrinous fluid. Both lungs showed decreased crepitations with increased frothing and edema. There were two regions of infarction in the upper lobe of the right lung measuring 4 by 2 cm. and 5 by 2 cm. respectively and another region of infarction in the upper lobe of the left lung measuring 6 by 4 cm. The transverse diameter of the pericardium was 13.5 cm., and the pericardial sac contained 300 c.c. of clear, straw-colored fluid. The heart weighed 575 gm. There was a "soldiers' spot" 1 by 0.4 cm. on the anterior surface of the left ventricle and another "soldier's spot" 2 by 3 cm. on the posterior surface of the right ventricle. There were vegetations on the mitral valve, which showed stenosis, grade 2, and insufficiency, grade 1, with marked shortening of the chordae tendineae. The interauricular septum was patent, the opening measuring 3 by 4 cm. A large vegetation was found directly in the open interauricular septum (Fig. 3). There were dilatation, grade 2, and hypertrophy, grade 3, of the right ventricle. The left ventricle revealed hypertrophy, grade 2, and the coronary arteries were sclerotic. Diameters of the cardiac valves were as follows: aortic valve, 5.5 cm.; tricuspid valve, 14 cm.; pulmonic valve, 10 cm. The depth of the left ventricle was 8.7 cm., the thickness of the wall of the left ventricle 1.8 cm.; the depth of the right ventricle was 9.3 cm. and thickness of the right ventricular wall 0.6 cm. Chronic passive congestion of the liver, grade 2, and fibrinous perisplenitis, grade 1, were present.

Fig. 3. Interauricular septal defect with vegetation involving the defect; hypertrophy of the right ventricle.

Comment.—This case is of particular interest for several reasons. A clinical diagnosis of congenital heart disease was made on the basis of the history of a murmur since infancy, the enormous hypertrophy of the right side of the heart, and the presence of a large pulmonary conus. Since the septal defect was associated with mitral stenosis, this case is another example of Lutembacher's disease. By far the most interesting aspect of this case is the presence of subacute bacterial endocarditis, an unusual complication of interauricular septal defects. To our knowledge,

Fig. 4. Interauricular septal defect.

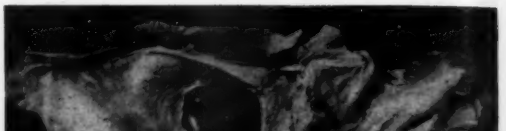

Fig. 5. Interauricular septal defect.

this is the second case ever reported in which the vegetations involved the septal lesion.

Case 3.—A man sixty-three years old was admitted to the clinic in December, 1927. In the course of physical examination the only clinical sign pertaining to the heart was a soft systolic murmur in the aortic region. January 7, 1928, the patient died suddenly of an entirely unrelated surgical condition.

At postmortem examination the anterior edges of the left lung were found adherent to the pericardium which measured 12 cm. in its transverse diameter and contained 75 c.c. of clear yellow fluid. The heart weighed 345 gm. The endocardium and valves were essentially normal except for the right and left coronary cusps of the aortic valve which contained irregular nodules of calcium deposit on the inner wall. The foramen ovale was almost completely open. On the left side of the interauricular septum there was a membranous flap attached posteriorly and open anteriorly, which, when elevated, showed an opening of 2 cm. in diameter (Fig. 4). This flap was held in place by thin strands of membrane. There was sclerosis, grade 2, of the coronary vessels. The diameters of the valves of the heart were: aortic valve, 6.5 cm.; mitral valve, 8.5 cm.; tricuspid valve, 8.7 cm. and pulmonic valve, 6.5 cm. The depth of the left ventricle was 7.5 cm., and the thickness of the left ventricular wall 1.2 cm.; the depth of the right ventricle was 7 cm., and the thickness of the right ventricular wall 0.4 cm. Histologic examination of the left ventricle revealed an increase in connective tissue, especially marked between the fasciculi and the individual muscle fibers, which were hypertrophied.

Case 4.—The patient was a woman fifty years old. Only the interesting postmortem findings in this case are presented. There was a pigeon breast deformity of the thorax. The pericardial sac measured 12 cm. in its transverse diameter and contained 75 c.c. of clear yellow fluid. The heart weighed 342 gm. The appendages, endocardium, and valves were normal. There was an interauricular septal defect measuring 3 by 2.5 cm. Both auricles and ventricles showed dilatation, grade 3 (Fig. 5). In the interventricular septum, 1 cm. below the right posterior commissure of the aortic valve, there was a region of marked thinning 0.6 cm. in diameter, but there was no patency of this septum. Diameters of the cardiac valves were: aortic valve, 6.5 cm.; mitral valve, 11.5 cm.; tricuspid valve, 14.5 cm. and pulmonic valve, 7 cm. The depth of the left ventricle was 11 cm., and thickness of the left ventricular wall 1 cm.; the depth of the right ventricle was 12 cm., and thickness of the right ventricular wall, 0.6 cm. Marked generalized edema of both lungs and congestion of the liver were present.

Histologic examination revealed a small area of chronic myocardial infarction on the anterior surface of the right ventricle. Both lungs, the suprarenal glands, the liver, and the right kidney revealed passive congestion; an old healed infarct was found in the right kidney.

Pathologic Features

Interauricular septal defect is the result of failure of development and union of the three embryonic anlagen: the endocardial cushions, the septum primum, and the steptum secundum. Originally the atrium is a single cavity. From the superior portion of this cavity the primary septum grows down to meet a much smaller sep-

tum, called the "endocardial cushions," which has developed from the inferior portion of the single atrium. The fusion of these two septums obliterates the ostium primum or primary communication between the auricles. Then an opening known as the "foramen ovale," or ostium secundum, is formed in the primary septum, thus reëstablishing the communication between the auricles. Later in the development of the fetus another septum, the septum secundum, grows down to the right of the primary septum. The foramen ovale is obliterated after birth by the fusion of this septum secundum with the primary septum. If the primary septum and the endocardial cushions fail to fuse the resulting defect is called a persistent ostium primum. If the union of the primary septum and the septum secundum fails the defect is called a persistent ostium secundum or patent foramen ovale.

This congenital lesion may occur as a single lesion. It frequently is combined with mitral stenosis, or it may appear in association with other congenital cardiovascular malformations. There is a difference of opinion concerning the relation of the mitral stenosis and the septal defect in many of these cases. Lutembacher expressed the belief that mitral stenosis is congenital in origin and produces an increased pressure in the left auricle which prevents the septum from closing, making the septal lesion a secondary one. Most authors, including Roesler and McGinn and White have expressed the opinion that the septal defect is the primary lesion and that the mitral endocarditis is an acquired and coincidental lesion. The latter view is the more feasible because approximately 25 per cent of cases of rather marked interauricular septal defect are uncomplicated by any mitral lesion.

In the presence of interauricular septal defect there are, aside from the septal defect, several other characteristic changes in the heart. The right auricle and ventricle are markedly hypertrophied and dilated, dilatation usually exceeding hypertrophy. The left auricle and ventricle usually are relatively small. Even in those cases complicated by mitral stenosis there may be no hypertrophy or dilatation of the left auricle because the septal defect relieves the pressure in this auricle and places the burden on the right side of the heart. Dilatation and hypertrophy of the pulmonary artery are so great that this artery almost always is larger than the aorta.

Clinical Findings

Since the pressures within both auricles are practically equal there is no reason to believe that there is very much admixture of blood in spite of a defect in the septum. When the septal defect is complicated by mitral stenosis the pressure in the left auricle is higher than in the right, and there is an arterial to venous shunt. Therefore, in the absence of congestive failure, if any appreciable admixture of blood occurs it is from the arterial to the venous side, and cyanosis does not occur. However, if an additional burden suddenly is placed on the right side of the heart by increasing the pulmonary pressure, there frequently develops a so-called effort-cyanosis, because the hemodynamic mechanism temporarily is changed, causing a shunt from the venous to the arterial side. This congenital defect has been classified by Bard and Curtillet, and Abbott as "cyanose tardive," because permanent cyanosis is present only in the very late stages of the disease, when cardiac decompensation has supervened, causing increased pressure in the right auricle and therefore a right to left shunt of the blood. Approximately a third of the blood must be shunted from the venous to the arterial side before cyanosis is produced. Clubbing rarely is observed in cases of uncomplicated interauricular septal defect. A deformity of the left side of the thorax is usually present. Taussig, Harvey, and Follis spoke of the characteristic appearance of these patients, who have delicate, semi-translucent skin, and are of slender build with light bony structure; this so-called gracile habitus was not present in our cases.

Thrills may or may not be observed. When present they may be systolic or diastolic and usually are felt in the pulmonic region. Murmurs are also inconstant and variable. The most frequent finding is a systolic murmur that may simulate closely the murmur associated with interventricular septal defects, but it is not so constant, is usually higher, and not so intense. This systolic murmur usually is heard best in the second or third interspace just to the left of the sternum. In the absence of congestive failure the pulmonic second sound is louder than the aortic, but this sign is of no value in those cases complicated by mitral stenosis. Because of the hypertrophy and dilatation of the right auricle and ventricle, which causes a counterclockwise rotation of the organ, the heart clini-

cally is enlarged both to the right and to the left of the sternum. Pulsation of the liver and of the cervical veins frequently is observed, particularly when the condition is complicated by a relative tricuspid insufficiency.

The electrocardiogram usually shows a right ventricular preponderance and high P waves. According to Graybiel and White the most pronounced degree of right ventricular preponderance is observed in three conditions: congenital dextrocardia, auricular septal defect, and the tetralogy of Fallot. In contrast to other types of congenital heart disease in which auricular fibrillation occurs infrequently, this arrhythmia very commonly is observed in cases of interauricular septal defect.

The only constant and reliable antemortem findings are those elicited by roentgenographic and roentgenoscopic examinations which reveal an enlarged, globular heart (most of the enlargement being in the right auricle and right ventricle), a very small aortic knob, a greatly enlarged pulmonary arch, and wide hilar shadows that frequently pulsate. Occasionally these enlarged hilar vessels are misdiagnosed tuberculosis, aneurysm, or tumor. Cramer and Frommel, and Lutembacher expressed the belief that the typical "coeur en sabot" configuration frequently is seen. This contour, however, is not present in uncomplicated cases.

Complications

In 75 per cent of the cases of interauricular septal defect reviewed by Roesler, valvular lesions were observed. In 68 per cent of the twenty-two cases reviewed by one of us (Tinney) there were chronic valvular lesions, 50 per cent of which were mitral stenosis. There is a much higher incidence of chronic valvular disease in association with this congenital septal defect than in association with any other type of congenital cardiovascular malformation. There is no good explanation for the fact that this defect is the only congenital cardiovascular lesion occurring commonly with mitral stenosis, an association frequently referred to as "Lutembacher's disease." This combination of lesions, however, had been described by many observers prior to Lutembacher's comprehensive study of the subject in 1916. Martineau,[14] in 1865, mentioned the first case of interauricular septal defect associated with mitral stenosis. This study was followed by many similar observations by other French authors, and in 1915, Abbott described two cases of interauricular septal defect, one of which was complicated by mitral stenosis.

Roesler was able to find only one case of chronic pericardial disease in his series and felt that this complication rarely occurred. Since Roesler's review there have been three cases reported that were complicated by chronic pericarditis, and Bedford, Papp, and Parkinson recently expressed the belief that "adhesive pericarditis" frequently is found in association with interauricular septal defects, but they did not explain what they meant by this term.

In contrast to the frequency of subacute bacterial endocarditis in association with other types of congenital heart disease, this complication rarely is found in cases of interauricular septal defect. Roesler, Taussig, Harvey, and Follis, and Joly denied its existence in association with this anomaly. In 1906 Griffith reported a case of this type in which vegetations were confined to the pulmonic and tricuspid valves. Jacobius and Moore mentioned the only reported case in which vegetations were localized to the septal defect and the mitral valve. In one of the cases reported by Bedford, Papp, and Parkinson the vegetations were found in the left auricle but involved neither the defect nor the mitral valve. For this reason our second case is of particular interest, because it is the second case to be reported in which the vegetations involved the septal defect.

The frequency of auricular fibrillation in cases of this congenital malformation in contrast to its rarity in cases of other congenital cardiovascular anomalies has already been mentioned. This frequency can possibly be explained by the high incidence of chronic valvular lesions, particularly mitral stenosis. Bedford, Papp, and Parkinson were unable to find any report of auricular fibrillation in association with uncomplicated interauricular septal defect among persons less than fifty years of age. One of us (Tinney) reported an uncomplicated case of this defect in which auricular flutter was present; the patient was forty-seven years of age.

Death fairly frequently occurs in cases of this type as the result of pulmonary infections, pulmonary emboli, or cardiac decompensation. When cardiac decompensation occurs it is due to failure of the right ventricle and is characterized by an

enlarged pulsating liver, engorged cervical veins, peripheral edema, ascites and late cyanosis. Pulmonary congestion and dypsnea are not conspicuous until the terminal stages.

Prognosis

It is difficult to say very much about the prognosis of interauricular septal defect *per se*, since approximately 75 per cent of all cases are complicated by chronic valvular lesions. Roesler divided his series of cases into two groups and observed that there was practically no difference in prognosis between the uncomplicated cases and those cases in which the defect was associated with chronic valvular lesions. Roesler noted that the average age of all the patients was thirty-six years or more; in twenty-four cases reviewed by one of us (Tinney) the average age of the patients was thirty-seven years. Pepper and Horack described a patient who died at the age of seventy-seven years; they believed this patient to be the oldest ever described in the medical literature, but Tarnower and Woodruff previously had written about a patient aged seventy-seven years. The average age of our four patients is fifty years; the youngest patient is thirty-six years old.

Summary

Four cases of interauricular septal defect have been presented. Two of these cases were complicated by mitral stenosis. One of them, the second such case ever reported, was complicated by subacute bacterial endocarditis, with vegetations involving the septal defect.

Aside from the septal defect the characteristic pathologic features are marked hypertrophy and dilatation of the right auricle, the right ventricle, and the pulmonary artery. The left auricle, the left ventricle, and the aorta are relatively small.

The most important and reliable clinical findings in the presence of interauricular septal defect are those elicited by roentgenographic and roentgenoscopic examinations which reveal an enlarged, globular heart (most of the enlargement being in the right auricle and right ventricle), a very small aortic knob, a greatly enlarged pulmonary arch, and wide hilar shadows that frequently pulsate.

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HEAT-RESISTANT BUTTER DEVELOPED BY ARMY

A new "butter" developed by the Army Quartermaster Corps can be shipped without refrigeration and will resist temperatures up to 110 degrees Fahrenheit. Ten thousand pounds have already been shipped to U. S. troops overseas.

Named "Carter spread" after its inventor, Lt. Col. Robert F. Carter of the Quartermaster Corps, the new butter consists of dairy butter fortified with hydrogenated cotton seed oil flakes to raise its melting point. Quartermaster Corps officers say it still tastes like butter.—*Science News Letter*, April 25, 1942.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

Frank C. Andrus, Pathologist

Presentation of a Case

DR. F. MOOSNICK: The case is that of a fifty-nine-year-old white male who was admitted to the hospital for the first time on December 10, 1941, complaining of back pain, weakness, and weight loss. He dated the onset of his symptoms to an attack in the fall, some three months before. He had the typical findings of an upper respiratory infection with wheezes in his chest, coughing, fever, and chills. He was confined to bed for a short while at that time. After the acute illness was over, he retained a chronic cough which was usually nonproductive, although he had expectorated slightly purulent sputum at times. He also complained of back pain and lumbar pain on the right which did not radiate but was dull and constant in character. The pain was increased by walking and moving. From the time of the onset of the attack in the fall, he had noted profound weakness to such a degree that he was unable to do any work and soon had to give up his usual occupation. It might be added that in his occupation as a painter he had come in contact with many kinds of paints and had not been overly careful in using or mixing them. Since the onset, although he noted no anorexia, he was unable to tolerate foods and lost 20 to 25 pounds in weight. His past history was not remarkable. He had undergone appendectomy some years ago. He had now a hernia at the site of the old incision. The family history was noncontributory. His father and mother were long-lived individuals, his father dying of heart trouble at seventy years and his mother at a similar age of Parkinsonism.

Physical examination revealed a temperature of 98.2 degrees, pulse 96 per minute, respirations 20 per minute, and blood pressure 104/70. He was well developed and well nourished and exhibited no evidence of the weight loss of which he had mentioned. The head, neck, and abdomen were negative. There was some tenderness over both sacro-iliac joints especially on the right side. Examination of the chest revealed wheezes and sibilant râles over the left upper lobe which disappeared after a few coughing spells.

Laboratory Data: The hemoglobin was 81 per cent, erythrocyte count 4,200,000, and leukocyte count 9,050 with a normal distribution. Blood morphology studies with particular reference to basophilic stippling were done, but were negative. The tests for syphilis were negative. The urine was negative. The sputum was examined for acid fact bacilli, but none were found. One of the specimens contained streaks of blood, and all were positive for occult blood. Stool examinations, however, were negative. X-ray studies had been done in the Out-Patient Department immediately before admission and had revealed some hypertrophic changes in the lumbar spine which were regarded to be sufficient to account for his low back pain. In addition, the chest film showed an increased density in the left upper lobe which the roentgenologist interpreted as atelectasis or some type of inflammatory reaction. The remainder of the lung fields were negative. X-rays two weeks later showed some clearing of the process along the lateral border of the heart. The impression was that the patient had some kind of an acute inflammatory process which was resolving. Although there was some clearing, density persisted. Bronchoscpoy, done during the hospital admission, was reported as negative. His further course was uneventful. He coughed very little bringing up about one fourth a cup of mucoid sputum each day. The back pain cleared with bed rest and he was discharged.

He was followed in the clinic. He gained 25 pounds in weight and felt well. The back pain cleared but he did not feel well enough to go back to work at any time. His chest was x-rayed again but the findings were not particularly impressive at that time. He continued along this course until the middle of this year at which time he had a sudden onset of a series of chills followed by bouts of fever. These attacks came on in the evening, usually occurred daily, and were followed by fevers up to 103 degrees. He had no sweats and his temperature dropped by the next morning. With this he had severe malaise and marked aching in his muscles. His cough which he had complained of at first and which had cleared, returned and was now dry and hacking. Because of the persistence of these complaints, he was readmitted to the hospital in July, 1942.

Physical examination now revealed a temperature of 101 degrees, pulse 80 per minute, respirations 20 per minute, and blood pressure 102/66. There was some evidence of weight loss and the patient appeared dehydrated. Physical examination was negative except for the chest findings. There was an impaired percussion note over the left upper lobe and to a certain degree at the left base. The breath sounds were increased over most of the left chest with increase in bronchial elements and prolonged respirations. In addition there were crackling râles at the left base posteriorly which cleared slightly on deep breathing, but which did not clear entirely.

Laboratory data: The hemoglobin was 81 per cent and the leukocyte count 5,950. The urine was essentially negative and the blood culture yielded no growth.

Agglutination tests were done but were all negative. Four sputum specimens were again examined for tubercle bacilli, but none were found. The sedimentation rate was 109 mm. in one hour. An electrocardiographic tracing was negative.

The patient was then bronchoscoped and a small tumor mass was found in the bronchus leading to the left lower lobe.

Clinical Diagnosis: Bronchogenic carcinoma.

DR. FRANK ANDRUS: We will now project a slide of the biopsy. Here we see squamous epithelium which is quite undifferentiated, does not have a clear lower border and appears to be invading. As you remember there are three main histologic types of bronchogenic carcinoma. There is the squamous type which is said to be more apt to give rise to ulceration of the bronchus and to formation of a lung abscess. Then there is the small cell or undifferentiated carcinoma. This latter type usually arises near the hilus of the lung and metastasizes quite readily to the lymph nodes. The third kind is the adenocarcinoma. These varied histologic types give rise to different clinical forms. One of them is the picture we are seeing with infiltration at the hilus of the lung. Another type produces a massive consolidation of one lobe and appears much like a pneumonia on x-ray and grossly. Another type produces multiple miliary lesions scattered throughout both lungs; and still another occurs near the periphery of the lung and often gives massive infiltration to the pleuræ.

I think that most of us now regard that the so-called "pleural endotheliomas" are actually bronchogenic carcinomas. A careful history is of utmost importance in the diagnosis of bronchogenic carcinoma. Whenever a pleural effusion, empyema, or lung abscess is seen which appears insidiously, and not as a complication of pneumonia, a bronchogenic carcinoma should be suspected especially when the patient is in the older age groups. Occasionally the patient gives a history of repeated attacks of pneumonia which actually represent episodes of pulmonary atelectasis. When we keep these things in mind, we will have a much earlier diagnosis of bronchogenic carcinoma.

DR. PEPPARD: In regard to the clinical story of bronchogenic carcinoma, what Dr. Andrus just said about the various types accounts for the many differences in the clinical picture and x-ray findings. Carcinomas will stimulate almost any kind of pulmonary disease at times. We are now a little more alert to bronchogenic carcinoma and not quite so apt to pass it up because of not thinking about it. Very often the prominent symptoms of which the patient complains are that of an associated lesion, and one of the common ones is that of atelectasis. Pleural involvement is significant. I went through a series of cases here at this hospital and, while I was aware of its importance, I was rather surprised to see the frequency in which diagnosis was made by the examination of blocks of tissue made from the sediment of the pleural fluid. Several patients had more than one bronchoscopic examination without the diagnosis being established.

DR. ANDRUS: Even in the best hands, bronchoscopic biopsy is positive for tumor in only about one-half of proven cases.

There are other types of bronchogenic tumors that we might mention. One is the type described by Pancoast where the primary tumor is in the superior pulmonary sulcus which then involves the cervical sympathetics and gives rise to a Horner's syndrome and which may invade the brachial plexus to give atrophy to the upper extremity on that side. Another tumor is that seen most often in young individuals, and is that of a benign adenoma of the bronchus which some people call Grade I carcinoma. These produce obstruction and intermittant atelectasis which is sometimes complicated by lung abscess. There are other rare bronchial tumors. On one occasion the bronchoscopist cut out a piece of cartilage and we thought that he was taking out a piece of the normal bronchus cartilage but it turned out that the patient had a primary chondroma of the bronchus. Another tumor was a spread from the hypernephroma which metastasized to the lymphoid tissue underlying the mucosa, producing a polypoid growth which projected into the bronchus. Another one was a metastasis from a gelatinous carcinoma of the colon which had previously been resected. This also produced obstruction to the bronchus and atelectasis.

DR. PEPPARD: From a series of 7,685 autopsies at the Cleveland City Hospital the lung was the second most frequent site of origin for primary malignancy, being preceded only by the stomach. In a series of 6,800 from Cook County Hospital, pulmonary carcinoma was third, stomach being the first and the intestines the second. Locally here at the Minneapolis General Hospital from 1935 to 1939 there were 20 cases out of 63,936 admissions, one bronchogenic carcinoma to every 3,129 admissions. At St. Mary's Hospital, Minneapolis, there were 14 cases out of 26,301 admissions, a ratio of almost double over that here, 1 to 1,878. At Glen Lake Sanatorium from 1916 to 1939 there were 17 cases out of 6,343 admissions making a ratio of 1 to 373 cases. From 1935 to 1939 Asbury Hospital, Minneapolis, had 17,424 admissions with 11 cases, a ratio of 1 to 1,584. This gives us an idea of the frequency of primary pulmonary cancer.

A STUDENT: How often do these tumors metastasize to the brain?

DR. ANDRUS: Quite often. Tumors of the lung go to the brain more commonly than any other tumors. The reason for this is apparently because most tumors give rise to emboli which have to go through the lung to get out into the greater circulation, whereas a tumor in the lung does not have to go through the pulmonary circulation but goes directly into the greater circulation. The lung is perhaps the most common source of metastatic brain tumors. It is so common a source that exprienced neuro-surgeons routinely examine the lungs when a patient presents himself with a brain tumor.

HISTORY OF THE MINNESOTA STATE MEDICAL SOCIETY

By ARTHUR S. HAMILTON, M.D.
Minneapolis, Minnesota

(Continued from July Issue.)

Thirtieth Annual Meeting

The thirtieth annual meeting of the Minnesota State Medical Society was held in Saint Paul, June 15, 16, and 17, 1898, the president, Dr. John F. Fulton, presiding.

The various routine matters necessary were taken care of with some differences of opinion and considerable time was thus consumed. The committee on diphtheria antitoxin which was continued from the previous meeting reported that "Antitoxin is so well recognized and settled as a necessary factor in the treatment of diphtheria . . . that detailed information would be valueless . . . Perhaps no remedy ever came to trial that stood the test and became standard so soon. . . . The value of the remedy is almost without parallel in the annals of medicine."

Thirty new members were admitted to the Society and various committees were appointed to preside over the sections.

The committee, appointed at the previous meeting to see whether something could be done to improve the laws relating to the office of coroner and those relating to expert medical testimony, made a lengthy report. They presented the bills regarding these laws which were introduced in the last legislative session at their request. Both bills failed but the committee stated that they were not discouraged and believed continued efforts should be made to reform the laws relating to these matters.

The Spanish-American War was in progress at this time and the remission of dues of members of the Society who were in the army was passed, as well as those who had paid dues for twenty-five years.

Dr. Fulton, in his presidential address, outlined the advances being made in medical education and praised the work that had been done in elevating the requirements before admitting a physician to practice his profession. He noted also the fact that these advanced requirements would soon eliminate the commercial and poorly equipped medical schools.

Forty-seven papers were read at this meeting, a number of these being case reports. Most of these latter were by younger men. Ophthalmology, Otology, and Laryngology which hitherto had been part of the Section on Surgery now existed as a separate section. Surgical papers were not as numerous as they had been in the past but the question of appendicitis still raged, particularly as to the time for operation. The Gynecology Section presented a symposium on extra-uterine pregnancy.

The three longest and most extensive papers presented were those on "Medical Education" by Dr. L. M. Crafts, "Medical Expert Testimony" by Dr. J. H. Dunn and "Artificial Immunity" by Dr. D. O. Thomas.

Many papers on laboratory methods of diagnosis were presented. It was about this time that laboratory work of this kind was beginning to be used in Minne-

sota, such as blood examinations, microscopic examination of the urine, the Widal reaction and the Diazo reaction.

All the papers were adequately discussed but at this meeting those who previously had prepared papers apparently stepped aside and gave others the opportunity to express their views.

Dr. F. A. Dunsmoor of Minneapolis was elected as the succeeding president.

Thirty-first Annual Meeting

The thirty-first annual meeting of the Minnesota State Medical Society was held in Minneapolis June 21, 22, and 23, 1899, Dr. F. A. Dunsmoor presiding.

The minutes of this meeting are more extensive than any of the previous sessions due particularly to relief of the physicians who suffered losses in the cyclone which destroyed New Richmond, Wisconsin, and the exertions of the osteopathic physicians to influence the legislature to make them eligible to practice their cult as legal practitioners of medicine.

Doctor Dunsmoor, in his presidential address, stressed the necessity of the profession to follow the ideals of professional ethics, to stand united against all chicanery and undignified practices, and to keep abreast of the latest advances in medical knowledge, both clinical and public hygiene.

The Society was now a large organization and the difficulty of providing time for the presentation of all papers offered presented difficulties. It was necessary to limit the time allotted to each speaker to overcome this difficulty. In all, forty-seven new members were admitted.

Because of the time limit placed on the reading of papers more than usual were presented, fifty-one in all. These were divided as follows: Medicine, thirteen; Neurology, four; Surgery, sixteen; Ophthalmology, Otology, and Laryngology, five; Gynecology, five; Obstetrics, six.

The papers presented by outsiders by invitation were delivered by Dr. John V. Shoemaker of Philadelphia on "The Psysiological and Medical Treatment of Insomnia," and by Dr. Franklin H. Martin of Chicago on "Retroversion of the Uterus." These were well received and discussed.

Dr. T. C. Clark reported on "Observations on the Medical Service of the Late War." Many inadequate methods of procedure had been started and it was hoped that abuses then prevalent would be corrected.

Dr. George D. Head presented an admirable paper on "Tuberculin as a Diagnostic Agent" and Dr. Frederic Leavitt read an excellent paper on "Smallpox," illustrated with photographs.

Many other excellent and well-presented papers were submitted and caused considerable discussion. It is of interest to note that many of the best were short, the authors avoiding elaboration of nonessential verbiage.

Thirty-second Annual Meeting

The thirty-second annual meeting of the Minnesota State Medical Society was held in Duluth June 27, 28, and 29, 1900, Dr. Walter Courtney of Brainerd presiding.

The routine matters of the meeting were quickly attended to. The only thing of interest was a motion, which was carried, that an effort be made to prevent the paying and receiving of commissions on cases referred by one practitioner to another. There was no debate on this motion.

As the American Medical Association was to meet in Saint Paul the next year a committee was appointed to arrange for the succeeding meeting, as some changes might be necessary.

Doctor Courtney, in his presidential address, reviewed the progress of medicine

during the past few years of the century and in addition mentioned some of the recent innovations in medical practice which he thought were objectionable in medical education, medical expert testimony, legislation, advertising and commissions.

Fifty-one new members were admitted to the society at this session, being the largest number admitted in one year. The transactions of this meeting were printed in octavo, smaller in size than those previously published.

Only twenty-seven papers were presented at this meeting. Apparently the Program Committee believed that a few well prepared papers were preferable to a larger number of smaller papers and case reports.

Dr. George D. Head, chairman of the Medical Section, presented "The Value of the Newer Signs and Procedures in Diagnosis." Dr. J. W. Bell presented "The Early Diagnosis of Pulmonary Tuberculosis." These were lengthy papers and were well presented and thoroughly discussed.

The State Board of Health presented two papers, one by Dr. Reynolds on "State Work with Infectious Diseases of Animals," and "Rabies in Minnesota" by Dr. L. F. Wesbrook.

In the Surgical Section, Dr. J. H. Dunn discussed "Penetrating Wounds of the Chest." Dr. Andrew J. Coey of Chicago, the only outside visitor, discussed "Blood Count in Surgical Diagnosis." This was a good paper but was much the same as that presented in 1899 by Doctor Head. Dr. C. H. Mayo presented a paper on "Varicose Veins," and Dr. C. A. Wheaton spoke on "Lymph Nodes as a Factor in Diagnosis." These papers were adequately presented and excited considerable discussion. For the first time the transactions contain an index.

We have now reached the end of the nineteenth century where our history for the present ceases. On reading the papers presented during the preceding thirty years the progress of medicine is well shown. It is to be regretted that practically all of those prominent in medicine in Minnesota during these years have passed beyond, but their influence on Minnesota medicine is still a pleasant memory and their contributions are well remembered today.

OFFICERS OF THE MINNESOTA STATE MEDICAL SOCIETY

1869-1900

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1870-1871	Samuel Willie	C. P. Adams	S. B. Sheardown
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1873-1874	W. W. Sweeney	H. C. Hand	S. B. Sheardown
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1887-1888	C. F. McComb	J. B. Simpson	S. B. Sheardown
1888-1889	C. G. Wheaton	C. B. Witherle†	S. B. Sheardown
1889-1890	J. H. Dunn	C. B. Witherle	C. B. Witherle*
1890-1891	W. L. Beebe	C. B. Witherle	R. J. Hill
1891-1892	Park Ritchie	C. B. Witherle	R. J. Hill
1892-1893	A. W. Abbott	C. B. Witherle	R. J. Hill
1893-1894	W. J. Mayo	C. B. Witherle	R. J. Hill
1894-1895	Justus Ohage	C. B. Witherle	R. J. Hill
1895-1896	Frank Allport	Ignatius Donnelly, Jr.	R. J. Hill
1896-1897	W. D. Flinn	Ignatius Donnelly, Jr.	R. J. Hill
1897-1898	J. F. Fulton	Ignatius Donnelly, Jr.	R. J. Hill
1898-1899	F. A. Dunsmoor	William Davis	R. J. Hill
1899-1900	Walter Courtney	William Davis	R. J. Hill
1900-1901	William Davis	Thomas McDavitt	R. J. Hill

†The office of Corresponding Secretary was discontinued in 1889 and was replaced by the office of Recording Secretary.

*Dr. Witherle completed the unexpired term of Dr. Sheardown who died while in office.

HOSPITAL SERVICE ENROLLMENT

A total of one-half million hospital service subscribers will be reached by fall, in accordance with an announcement made at a recent meeting by James McNee, superintendent of St. Luke's Hospital, Duluth, and president of the Minnesota Hospital Service Association.

"The Minnesota Hospital Service Association, which is observing its ninth anniversary this year," said Mr. McNee, "expects to reach an enrollment of one-half million subscribers by fall.

"We begin our ninth year with a record payment of $5,773,499.00 in hospital service for our subscribers. Since 1933, 190,164 subscribers have been hospitalized.

"In 1942, alone, it is estimated that over $1,000,000.00 will be paid to hospitals for subscriber hospitalizations. This means that 83 per cent of this year's income will be returned to the subscribers in the form of hospital service," he stated.

"An interesting fact is that 70 per cent of the Minnesota Hospital Service subscribers in the Twin Cities area use more expensive accommodations than the three or four-bed room accommodations. This indicates that where a hospital service contract relieves expense, people prefer using higher priced accommodations," concluded Mr. McNee.

At the same meeting, Arthur M. Calvin, executive director of the Association, made a comparison of the Plans present size with its size in 1933. He said, "At the end of our first year of operation, there were but 2,000 subscribers enrolled and there were only seven contracting hospitals. These hospitals were all located in Saint Paul. Today, we have 483,000 subscribers and 102 hospitals in Minnesota are affiliated with the Plan.

"With the recent enrollment of the Twin City Ordnance Plant and the Gopher Ordnance Plant Area Engineers, all the defense plants in the Twin Cities have hospital service groups," said Mr. Calvin.

"Our Plan, with seventy-one other non-profit Blue Cross Plans in the nation, forms a vital part of the national defense program, and has recently been endorsed by the Office of Defense Health and Welfare Services.

"It is because of the wholehearted coöperation of civic leaders, employers, employees, hospitals and the medical profession that the Blue Cross Plan has become an important part of community life in Minnesota.

"Because of the unselfish interest of the press and radio stations in the state, thousands of persons in Minnesota have become acquainted with our non-profit Blue Cross Plan for hospital care," Mr. Calvin concluded.

The purpose of the Minnesota Hospital Service Association is to provide hospital service to groups of employed persons. However, subscribers who enter the armed forces may continue their contracts for the benefit of their dependents at a reduced rate. If the subscriber has no dependents, he may suspend his contract while he is in service. When he returns to civilian life, he may reinstate his contract without loss of benefits.

President's Letter

DUES DURING THE WAR EMERGENCY

TWO years ago the Council recognized that physicians in service should be maintained in active membership and announced the policy of encouraging local or component societies to carry the dues of their members who were in active service. This was done in almost all of the societies. Later it became evident that some of the larger societies could not do this and properly maintain their necessary local activities. A year ago, therefore, the House of Delegates passed a resolution to the effect that the State Association should arrange for the payment of dues of those in service with the rank of Captain or below in the Army and Lieutenant Commander or below in the Navy, if so requested by the member concerned and the responsible officers of his local society. It appeared that even this plan would be less successful as more physicians were called into service, as the load became heavier, and as some societies were called on to make very large contributions in proportion to their incomes. Consequently, at the last session of the House of Delegates, after extended discussion it was decided that, in fairness to all physicians in the state, some method of equitable distribution of the financial load should be formulated. A temporary contribution, effective in 1943, of five dollars a year during the war emergency was proposed to help pay the dues of all medical officers. And I think I am correct in stating that this proposition was finally supported unanimously.

I am sure the members of the Association will accept without hesitation the decision of the House of Delegates to increase the dues for the period of the war emergency, particularly if they understand the necessity of such a decision and the fact that it was arrived at only after full and free discussion and mature consideration. It should be clearly understood that the additional contribution is temporary, and for the period of the war emergency only, which ordinarily means for the duration of war and for the period of adjustment after peace has been declared.

Preceding the adoption of the proposal, three questions especially were discussed at length: further economy in administration, possible curtailment in the activities of the Association, and the use of our reserve fund. Economy in administration has been practiced for years. As former chairman of the Finance Committee I am familiar with this practice. The unification of all administrative activities in one office under a full-time staff of exceptional ability led to a consistent annual saving. Moreover, few of the expenses of officers and committeemen are charged to the Association. Economy has been the watchword since the depression of 1932 in so far as it was consistent with the responsibilities of the Association to its members and to the public.

Curtailment in the activities of the Association can be accomplished in only a few minor fields. In general we must maintain our activities to fulfill our responsibilities. In fact, in certain fields our activities must be expanded to meet wartime demands. For instance, a very considerable expense has had to be assumed in connection with the Procurement and Assignment Service. Campaigns for public health and welfare must be actively maintained in order that epidemics may be prevented and as firm a foundation as possible may exist for recovery after peace has been restored.

Some of our reserve fund may have to be used. It is not large for such an important organization, about $44,000. If 900 physicians are in service in 1943 our income will be reduced by $13,500. Assuming a membership of 2,600, there will be 1,700 remaining who pay dues. The additional amount received from these 1,700 will be $8,500 or $5,000 less than we now receive. Consequently, even with the additional dues it will be necessary to economize where we can and to curtail our activities where it is possible. It may be advisable to utilize some of our reserve fund, but I sincerely hope that this will not be so. An organization of the size and importance of the Minnesota State Medical Association should by all financial criteria have a much larger reserve fund than we now possess.

I have discussed this subject frankly with you because every member is entitled to know the exact basis for the decision of the House of Delegates. Obviously all details cannot be presented in this short letter. If there are other questions in your mind on the subject I shall hold it an honor to correspond with you personally.

H. Z. Giffin

President, Minnesota State Medical Association

EDITORIAL

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BUSINESS MANAGER
J. R. BRUCE

Volume 25 AUGUST, 1942 Number 8

THE NATIONAL PHYSICIANS' COMMITTEE

NEXT November the National Physicians' Committee will have been three years in existence. It is time to take stock and ask what is its record of accomplishment. Why, for instance, does the American Medical Association give this Committee its unqualified indorsement? For in the resolutions adopted at the recent Atlantic City Convention of the AMA were two noteworthy statements:

I. BE IT RESOLVED that we register our approval of the activities of the National Physicians' Committee for the Extension of Medical Service, commend the Board of Trustees and the Management of this institution for the efforts they have made to enlighten the general public in connection with American Medicine's methods, progress and achievements, and in pointing out that the public has a vital interest in the final results.

II. BE IT RESOLVED that we, the House of Delegates of the American Medical Association, place ourselves officially on record as recognizing our responsibility for making the utmost effort to preserve the elements of independence and freedom of action that will make possible the easy reëntry of physicians to civilian practice. To this end we recommend that a definite part of each program of every component Medical Society be devoted to a reconsideration of the traditions, the standards, the freedoms, the effects of the absence of restraints and outside controls which have contributed so materially to American Medicine's unequalled progress and vast achievements.

This second resolution indicates the necessity for the fight to maintain the traditions and principles of American Medicine which have made our country the healthiest in the world. It is this fight that the National Physicians' Committee has been waging. In these two and a half years, thousands of educational pamphlets which preached sound medicine and set forth the record of medicine in America have been broadcast over the country. About one hundred of the leading newspapers of the country carried a full-page advertisement of medical achievement. Two similar full-page statements appeared in the *Saturday Evening Post,* one coming out prior to the Republican National Convention, the other prior to the Democratic National Convention. At the present time there are being sent to over twelve thousand newspapers weekly releases of stories which help to educate the public in the principles of sound medical practice.

Such has been the work of the Committee. Now as to the results: Elimination of medical planks in the platforms of both Republican and Democratic Parties was due largely to the activities of the N.P.C. The same agency was partly responsible for the statement of the President of the United States at the dedication of the Government hospital at Bethesda, Maryland, upholding the preservation of American standards of medicine. Who can tell how far-reaching and powerful has been the influence of this campaign in public health?

During the past year the committee has made notable advances in forming supporting organizations in many states of the Union. As a result of this and with the backing of the two resolutions passed at the recent meeting of the House of Delegates of the American Medical Association, it is expected that the support of the activities of the N.P.C. will be greatly augmented. With increased funds N.P.C. is planning to enlarge its activities and make its influence felt even more prominently than in the past.

Is it worth your while to keep up the good work of the N.P.C.? Evidently Minnesota doctors have thought so. In the fiscal year just past, they contributed the largest sum given by the physicians of any state in the Union. Even Texas and Michigan trailed Minnesota. We believe that the work of this committee on a national scale is worthy of the continued support of the medical profession of the country.

The committee is making the following plans:

1. To issue a monthly Bulletin to all subsidiary organizations.

2. To engage the services of several men who will act as field men, visiting various organizations in the country and helping them in increased activities.

3. Among various other enterprises it is considering the development of legislative activities to safeguard the independence and freedom of American Medicine in the post-war reconstruction period.

It has in mind following some of the activities carried on by the Committee on Legislation in Minnesota, which are recognized as being preeminent in work of this kind. It also is planning an increased radio program during the fall and winter.

In order to do this, it will be necessary for those who have subscribed to the National Physicians' Committee to continue their active support. Otherwise, of course, this sorely needed agency will be unable to function. It would be greatly appreciated if all who have subscribed in Minnesota during the past year would repeat their subscriptions this year and if the men who have not subscribed would realize the great need of their active support. Plans are being made to carry on the campaign for additional subscriptions again this fall. In the meantime, if you find it possible to subscribe now and would care to do so, make your check payable to the National Physicians' Committee, and send it to either one of the undersigned, who will then forward it to headquarters in Chicago, which in turn will send acknowledgment direct to you.

WILLIAM F. BRAASCH, M.D.
Secretary and
Member, Board of Trustees.
F. J. SAVAGE, M.D.
Chairman, Minnesota Division,
National Physicians' Committee.

THE DOCTOR IN SERVICE

WHEN war descended precipitately on our peace-loving people there was left no alternative but to assemble a huge army for our country's defense.

We know that modern armies are made up of men and machines. An adequate proportion of doctors must of necessity be with the men. Doctors are just as necessary to our own army as are doctors in the German or the Japanese or any other army. There is the same devotion to professional duty on the part of medical men, of any race, in all armies at war today; the art of healing knows no nationality.

Apathy on the part of the civilian physician toward assuming military duty is not unnatural. His training has not been with a military career in view. His life has been geared to a plan of practice in a day of peaceful pursuits. But after all, is it so very different? He relieves headaches, constipation, sore throats or appendicitis and takes these things as a matter of course in his daily round at home. But we must not forget that the boys in uniform have all these. And, too, the boy in uniform may be homesick or "jittery" or uncertain or confused about his military life, so new to him. He may even have fears he would disclose only to the doctor in his outfit. It is true that the man who has embraced the profession of medicine will always be a "doctor" in a certain personal sense to those outside the profession, even to the man in uniform. The patient who says, "I feel better, doctor, now that I have talked to you," may just as well be a man in uniform, and every physician knows how good that sounds to him.

A doctor's desire to serve with the troops is not all patriotism; it is more than that. It is his innate desire to render the same sort of service

to his fellow men in service that he has at home. The company, the battalion or other unit to which he is attached may be regarded as his village, town or city practice. He is the guardian of the health and well-being of these men. If he does it well and conscientiously they will render him the same loyalty and gratitude he received at home. The need of the troops for attending physicians is great. We hope that need will be rapidly met by physicians applying for commissions.

—A. N. C.

MORE ABOUT ENLISTMENT

THE lagging in voluntary enlistment of physicians in the Medical Corps of the army has been due to some misunderstanding as to the method of procedure. Some physicians who filled out certain official forms wherein they specified certain preferences in the various services had the impression they were applying for commissions. The lack of functioning on the part of the Procurement and Assignment Committees in designating who of the groups of physicians in the various county societies certified as nonessential to civilian practice should enter the service first still left the decision to each individual physician. The subject has been clarified since the State Medical Meeting in Duluth in June.

At that meeting the State Delegates agreed that all physicians under forty-five years of age should hold themselves in readiness to apply for commissions in the armed forces as the need should arise. They also agreed that for the present and until the emergency demands otherwise only those under thirty-seven years of age, with a few exceptions, would be called upon to apply for commissions.

In our last issue we suggested the advisability of establishing quotas for states and component county societies as desirable in determining how many physicians should be obtained from the various districts of the state. Apparently this has been done. While Minnesota is still some 400 short of its quota, it is not deemed advisable to obtain this many enlistments at once. Some 250 letters were sent out by the chairman of the State Procurement and Assignment Committee under date of July 14, to physicians under the age of approximately thirty-seven, who had been certified by the various county Procurement and Assignment Committees, informing them that they had been selected for military service and suggesting that they apply for commissions as soon as possible. The names of these available physicians have been submitted to the Selective Service and Medical Recruiting Boards. The draft numbers of these men have already been called and the only reason these individuals have not already been called is because action of the Procurement and Assignment Committee has been awaited. This action was taken in order that the civilian population in certain districts need not suffer from lack of medical attention.

There need be no further cause for misunderstanding. These 250 men are those who the Committees on Procurement and Assignment feel should enlist. The decision no longer rests with the individual physician. Those who received this letter may feel assured that in the opinion of their confreres they can be dispensed with in civilian practice and it is proper for them to enlist. Doubtless the response will be satisfactory now that the atmosphere is cleared.

This war is no child's play. The armed forces need more doctors. The younger ablebodied doctors should be the first to enlist. Without a doubt those in the older age group of thirty-seven to forty-five also will be needed soon.

A doctor entering the army makes a sacrifice, financial and otherwise. The medical corps is no place for a conscientious objector, in spite of a recent assignment to the medical corps of a former prominent Hollywood star, who had declared himself a conscientious objector. The medical corps of the army and physicians in general should, and doubtless do, resent the implication. Admittedly a physician in the service is not likely to have as hazardous an assignment as a flying pilot or gunner, but upon enlisting he puts himself at the disposal of the Surgeon General as to where and how he shall serve. An enlistment in the Medical Corps is still proof of a physician's patriotism.

SELECTEES REJECTED BECAUSE OF TUBERCULOSIS

X-RAY examination of the lungs is a routine procedure for induction into the army and in the preëmployment examinations for the Twin Cities Ordnance Plant. It is said that about 0.5 per cent of the many thousands who have so far been examined for induction into service in this

state have been turned down on account of pulmonary tuberculosis. Presumably this number includes arrested cases for they are not accepted into service.

This detection by x-ray of active or inactive cases of pulmonary tuberculosis in presumably healthy individuals affords an opportunity for the agencies, such as the State Board of Health and the Minnesota Public Health Association to contact these individuals, trace their sources of infection and follow their treatment.

With this purpose in view a meeting was called June 1, 1942, by the Minnesota Public Health Association and its two constituents, the Hennepin and Ramsey County Public Health Associations, for the discussion of the best method of procedure. In attendance were representatives of the State Board of Health, the Minneapolis and Saint Paul Boards of Health, the Medical Department of the Induction Center at Fort Snelling, the Medical Department of the Twin Cities Ordnance Plant, the State Rehabilitation Department of the Division of Social Welfare and the volunteer tuberculosis associations.

As a result of this conference it was arranged that those individuals with x-ray evidence of pulmonary tuberculosis encountered not only at the Fort, but at the plants at New Brighton and Rosemount will be reported not only to the State Board of Health, but to the Health Departments of the Twin Cities and presumably local health authorities in the rest of the state. Radiographs taken at the Fort are sent to local draft boards for the use of the rejected draftees and their private physicians.

In the interest of rehabilitation and the use of available manpower in the present emergency, it was brought out that many ordnance jobs which do not require much physical effort and with healthy atmospheric surroundings are ideal for those individuals with arrested pulmonary tuberculosis, providing periodical examinations are arranged for. This need not be done at public expense since ordnance employes can afford to pay for such examinations themselves. This arrangement is in their own interest as well as that of their fellow employes, and is already in effect in many industrial plants, where it works effectively.

With this evidence of coöperation on the part of army, ordnance and state and voluntary health organizations the wholesale examination of the younger male population of the state may be made to aid the tuberculosis fight so that the downward trend in the mortality rate of this disease may continue during the coming years.

WAR SAVINGS BONDS

THE tempo of the nation's war effort has risen by leaps and bounds during the last several months. The battleline on which our American men are fighting extends to every continent. The supply lines are carrying tools of war in ever-increasing quantities from our shops and factories. The American spirit is geared to high pitch with the intent to hit full stride and get this business of war settled with Democracy the victor.

With the increasing intensity of effort comes also a pyramiding of cost. For the fiscal year 1943, the war program will require an estimated total of 70 billion dollars. Even with increased taxes, such revenues will fall far short of meeting the bill. Of the total war and nonwar costs of Government for this coming year, the Treasury Department will have to borrow some 52½ billion dollars on the basis of present estimates. To borrow in the best way possible is the goal.

Our fiscal program like our production line is directed toward the total war effort. The fiscal program, however, is designed not only to meet financial needs of the nation, but is concerned with broader economic requirements as well. Our national income has increased some 3 billion dollars a month over that of two years ago. The American public must defer the purchasing made possible by this increase until after the war, when the nation's productive plant is reconverted to meet consumer needs. That is one major reason why the Government has set the billion dollar a month quota for the purchase of War Savings Bonds.

The quota figure may seem a stringent demand since it calls for 10 per cent of all individual incomes, but this war can't be won by wishful thinking. And deferring one's spending until the post-war period is little in the line of actual sacrifice. The 10 per cent is not *given* to the Government. The money purchases securities upon which returns as high as 33⅓ per cent are paid when the bonds mature. Fulfilling our quota of bond purchases during each month as long as the war may last will go far in financing our war effort both adequately and beneficially to us all.

Tire, gasoline, and sugar rationing require adjustments in our everyday habits of living. It is no less necessary that the budgeting of dollars for War Bonds become a daily habit. Americans are fighting for total victory and we as a people are willing to invest in that victory. But this problem is no future problem—it must be met now by every American who receives wages and income.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

HOW AND WHEN

Current military needs for physicians—and how to fill them—superceded all else in the discussions of the delegates and officers of the Minnesota State Medical Association in their 89th annual session in Duluth.

The question at issue was not, shall we offer our services?—but how—and when—shall we offer them?

It was complicated by general misunderstanding of the function and scope of Procurement and Assignment and of the significance of the PAS classification "available," as applied to physicians of military age.

When the heat of controversy had blown away all who participated agreed that the session had been stimulating and valuable, that misunderstandings had been cleared up and the way was open for Minnesota, already well in the forefront of the states, to complete its quota of medical officers for the army.

Misconceptions

Notable among misconceptions held by many of the older as well as younger members was this one to the effect that Procurement and Assignment committees should be expected to take into account family and financial considerations in classifying men as "available" or "not available."

Family and financial considerations and physical condition are no part of the business of Procurement and Assignment committees. All such considerations belong to the individual and his Selective Service Board only. By regulation and special arrangement, the advice of the Procurement and Assignment Service is accepted by Selective Service Boards in one matter only—that of community need.

If a man is considered essential, by reason of the fact that he is alone in a community or he occupies a critical position on a hospital or teaching staff, then the Procurement and Assignment Committee marks him unavailable and the Selective Service Board abides by that classification. If not, he is marked available and it is left to army medical examiners to pronounce upon physical condition and to Selective Service Boards to pass upon claims for dependency and other civilian obligations.

Recruiting Short-Cut

Another misunderstanding had its basis in Procurement and Assignment plans as orginally published by the *Journal of the American Medical Association*. Many young men who have long since indicated on their questionnaires their willingness to serve with the armed forces were still waiting to be notified by Washington that they were needed. They did not understand that the Medical Recruiting Board had been set up as an emergency measure to expedite the original procedure and recruit the young men who were willing to serve immediately to meet the critical demands of the growing army.

The fact is, as army representatives pointed out in Duluth, that the recruiting methods of PAS from Washington, necessarily hampered by necessities for correspondence were too slow to meet the need. The recruiting boards were set up to fill the same function, but speedily, in order to get urgently needed doctors into the service.

Letter Sent

On the basis of the understanding reached in Duluth, the state Procurement and Assignment Committee sent a letter of explanation to each member following the meeting. The letter announced that all physicians under the age of 45 should hold themselves in readiness to apply for commissions as the need arises. For the present, however, and until the emergency demands otherwise, only those who are under thirty-seven years

of age, and a few other special cases, will be called upon to apply for commissions.

A letter was to be sent to all of the latter who have been classified as available, informing them of the fact and urging them to apply immediately to the Medical Recruiting Board set up by the Surgeon General of the Army at 496 Lowry Medical Arts Building in Saint Paul.

This Board is now made up of Major C. A. Wood, representing the Surgeon General, Major Baptiste Groebner, representing the Adjutant General, Captain George E. Moore of the Army Air Corps, and Lieutenant Delow W. McCormack of the Dental Corps.

Minnesota is still some 400 short of its quota of approximately 900 physicians required by the Army and the Board will remain in Saint Paul, it is understood, until that quota is filled or other methods are put in force for securing the required number.

No Experiments Here

War with its drain upon finance and manpower leaves little time or popular attention for the experiments in new types of medical service which formerly occupied the foreground of much medical as well as lay discussion.

In Minnesota the Committee on Sickness Insurance of the Minnesota State Medical Association continues its detailed studies of all legal and social aspects of sickness insurance but is not prepared to promote any type of prepayment plan for medical services. Several county societies have considered the matter and have been assured of the interest and assistance of the state committee; but experience in other states has not been such as to prompt precipitate action here.

Aid Offered

The state committee reported on its studies in Duluth, offered its services to interested groups who would like the benefit of figures gathered in its files but made no recommendations for immediate action.

Meanwhile a prepayment plan for Farm Security Administration clients was reported as underway, with Council approval, in two counties—Ottertail and Morrison. No conclusions as to the success of this first undertaking of the sort in Minnesota were made to the Delegates inasmuch as the experiment is not yet one year old.

WARTIME CHANGES

It is probable, in view of wartime pre-occupations, that attempts at out-and-out socialization of medicine by the government is unlikely for some time to come. Changes in the pattern of American medical service are more likely to come about through special programs for special population groups, such as mothers and babies and industrial workers. These programs would be inaugurated by regulation through special wartime powers to care for emergency needs.

Dr. Martha W. Eliot of the Children's Bureau is already advocating extensive new maternity and child health services to be set up on a war-emergency basis and financed on a matching basis out of social security funds.

Health Education in Minnesota

Public Health education continues to be a major function of organized medicine and the need for it becomes more acute as the war advances.

The work of the Minnesota State Medical Association in this field is outstanding, as reports of committees to the House of Delegates in Duluth clearly indicated. Medicine in Minnesota has forged ahead, in coöperation with the State Board of Health, in many fields. Active and continuing programs in nutrition, immunization and tuberculosis control were reported to the delegates, and also in the detection of eye and hearing defects in children and in the early discovery of cancer.

Program Varied

Simple nutrition pamphlets have been put in the hands of physicians for distribution to their patients. Posters and leaflets on immunization and vaccination have been disseminated widely over the state and the Meeker county experiment in county-wide testing of the population for tuberculosis, coupled wtih the newly inaugurated system for accrediting counties for tuberculosis control in the human population, has attracted nation-wire attention.

In addition to these special undertakings, a weekly radio program, a weekly question and answer service to newspapers, college lectures and the monthly packet service to physicians designed to aid them in public education as well as in their own practice form the groundwork

of systematic authoritative information on health in this state.

Foundations at Work

The growing interest in health everywhere is revealed by the fact that health programs now outrank education as the foremost concern of private foundations. A recent survey showed that 314 leading American foundations now grant a total of $40,400,000 annually to this branch of social betterment.

The endeavor of the foundations is scattered, however, and it seems obvious that medicine and the medical profession must dominate the thinking and the action in this field; otherwise the public health education of the future may well be guided by men who do not understand essentials of public health.

Meanwhile, health education has become an essential part of the war effort and physicians in Minnesota, as the reports of their work in Duluth amply showed, are well prepared to assume the necessary leadership in this field.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

De Witt, Iowa, Physician Loses Minnesota License for Felony Conviction

Re: State of Iowa vs. Morton Lyon, M.D.

At the last regular meeting of the Minnesota State Board of Medical Examiners held on July 10, 1942, the Minnesota license to practice medicine held by Morton Lyon, M.D., DeWitt, Iowa, was revoked. Dr. Lyon was convicted on September 9, 1935, in the District Court of Clinton County, Iowa, of a felony, to-wit: An attempt to produce abortion. At that time Dr. Lyon was sentenced to a term of not to exceed 5 years in the Iowa Prison at Fort Madison. He was also fined $500.00 and costs. The Court suspended the sentence during good behavior, but subsequently, and on April 22, 1940, the Court vacated the suspension and ordered Dr. Lyon committed. Shortly thereafter Dr. Lyon took an appeal to the Supreme Court of Iowa, but the appeal was dismissed on November 20, 1940. On November 14, 1940, Dr. Lyon was granted a parole by the Governor of Iowa, on condition that he surrender his Iowa license to practice medicine and close his office.

According to the records of the Minnesota State Board of Medical Examiners, Dr. Lyon was born in 1866, and graduated from Rush Medical College in 1896. He was licensed to practice medicine in Iowa and Minnesota the same year. Dr. Lyon was licensed to practice medicine in Illinois in 1898 and in South Dakota in 1901.

BIRTHS AND DEATHS IN THE UNITED STATES

While the United States set a new record low for infant and maternal death rates in 1940, the "Vital Statistics Summary: United States, 1940" finds that the general mortality rate increased slightly, from 10.6 per thousand to 10.8. This change was due largely to increase in deaths from heart disease, cancer and diabetes. The birth rate, however, also increased from 17.3 per thousand of population in 1939 to 17.9 in 1940, which is the highest recorded from the birth registration area since its completion in 1933. Possibly this indicates a cyclic change closing a long period of a declining birth rate.

This increase in birth rate has been accompanied by a reduction of the infant mortality rate to 47.0 per thousand live births in 1940, which was the lowest ever recorded for the birth registration area. However, the provisional infant death rate for 1941 is 46.2, which would seem to predict a further decline. In 1915 the infant death rate was approximately 100, so that the last twenty-five years has seen a decline of about one half. It is estimated that this amounts to the saving of the lives of 973,626 infants that would otherwise have been among the 3,264,365 infants that died during the past twenty-six years. This reduction in infant mortality has taken place in both the white and Negro races, although the rate for Negroes is still considerably higher than that for the white race. The rate of decline of infant mortality has been slightly greater for the Negroes than for the white race.

The lack of medical care in rural districts, of which so much has been said and written, did not raise the death rate on the farms to the level of the city population. The rural rate in 1940 was 9.8 per thousand of population, while in the cities of more than a hundred thousand residents it was 11.3. The highest rate (12.4) was in cities of between 2,500 and 10,000 population. Males have a decidedly higher death rate than females: 12.0 to 9.5 per thousand of population, respectively. There is an even wider difference between the white and other races, the white being 10.4 and "other races" 13.8.

A comparison of the crude death rates for thirty-three specified countries, of which the latest information is for the year 1937, shows that of nations with a dominant white population Chile has the highest death rate. Yet Chile is the only nation on the western hemisphere that has an extensive system of sickness insurance. The only nations that have a lower death rate than the United States are Denmark, Uruguay, Norway, New Zealand, Australia, Canada, Union of South Africa and the Netherlands. Denmark is the only one of these countries that has a nationwide system of compulsory sickness insurance.

There is eighty times as much tuberculosis found in discharged sanatorium patients as in the unselected population, it is estimated, and thirty times more tuberculosis in the contact group than the general population.—L. M. Morse, M.D., *Wis. Med. Jour.*, Mar., 1941.

To attend school, the young man or woman must be properly clothed. If his clothing becomes soiled or torn it should be cleaned and mended but the tailor's work, though valuable, is no part of education. Likewise, to profit in school training youth should be clothed in health. If health is impaired it must be repaired. But the medical sponging and patching are neither education nor hygiene, though the methods used in such repair may be, and are, increasingly educational.—Ed. *News Letter*, Loyola Univ., Jan., 1942.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases

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WORKER HEALTH MEASURES IN TWENTY-FIVE STATES

Minnesota is one of twenty-five states in which there are actively functioning industrial health units. The states are well distributed geographically over the country and they include in their jurisdictions a labor force of approximately twenty-nine and one-half million workers, more than half of that for the whole country.

A total of 215 persons were recently discovered by the United States Public Health Service to be carrying on the activities of these departments, including physicians, engineers, sanitarians, a few nurses and clerks, with a total expenditure of slightly more than one-half million dollars.

Functioning thus, with a bare nucleus of personnel and inadequate budgets, the health service nevertheless found that these divisions were carrying on an effective and widely diversified program.

Study Launched in Minnesota

The following recommendations made on the basis of a study of the work of these divisions is particularly interesting to Minnesota physicians in as much as Minnesota's Division of Industrial Health is already well launched upon the investigation of occupational disease in Minnesota which the health service found largely lacking in most parts of the country.

"Several pertinent facts were brought out by this analysis," says the report. Of the twenty-nine and one-half million workers in these twenty-five states, about one-half of whom are engaged in industries with potential health hazards, less than two million were reached through industrial hygiene services during the period of a year. With the present personnel and budgets, this represents the peak load these divisions can apparently carry. The analysis further points out that probably one-half of the employes are working under conditions that need some correction or improvement. Instead of these conditions improving they may be growing worse as the result of increased industrial production. Individual company reports have revealed, for example, that new health problems, totally unrelated to normal times, have been created and are causing bottlenecks in productions: that days lost from sickness and accidents have increased and that many instances of occupational diseases have developed as a result of use of toxic materials, because the supply of relatively safe substances is being diverted for production of war materials or cannot be replaced.

"These conditions clearly indicate the need for more follow-up work in those plants where recommendations for improvements have been offered. More effort in this direction will mean more compliances. Experience has shown that industry is more likely to coöperate if convinced of the need for such improvements and assured of the interest and determination on the part of the government agency responsible to see that they are carried out.

Less Than Four Per Cent

"Another shortcoming in the industrial hygiene programs is investigation of occupational diseases. The results of the analysis revealed that less than four per cent of the investigations were made for this reason. The divisions can do much not only in stimulating such investigations but also in sponsoring and inaugurating the uniform reporting of occupational disease.

"In addition there is the problem of absenteeism reporting from all disabilities, an activity that is still unexplored. Industry is not fully aware of the importance of such statistics in determining the nature and extent of its health problems. In concentrating on the vital necessity of speeding up production, it is likely to overlook the somewhat obscure factor of lost time from sickness as a cause of impeded production. The divisions can sponsor and stimulate absenteeism reporting by persuading industry to adopt systems of keeping the necessary records."

TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, March 5, 1942

President ARTHUR BRATRUD, M.D., in the Chair
Secretary R. F. McGANDY, M.D.

TRAUMATIC DISORDERS OF THE PERIPHERAL VASCULAR SYSTEM

U. SCHUYLER ANDERSON, M.D.
Minneapolis, Minnesota

Since loss of blood is one of the most serious consequences of all injuries, wounds of blood vessels have always held the interest of surgeons. Although the treatment of open wounds of blood vessels is the everyday practice of all surgeons, closed vascular traumas and functional disturbances which are traumatic in origin receive relatively less attention. The study of traumatic disorders of the peripheral vascular system becomes of great interest today because the occurrence of these injuries is greatly increased during war. Matas[23] estimated that in World War I 20-25 per cent of the wounded reaching the surgeon at the first post of relief had major blood vessel injuries. In World War II, the civilian surgeon may be as much concerned about this subject as the military surgeon because of the aerial bombardment of cities and apparent non-military objectives. It is the present opinion that the surgeon is now better able to treat these injuries because he has at his command heparin, sulfonamides, blood banks and human blood plasma. A more hopeful attitude toward reparative vascular surgery is afforded by the use of heparin as demonstrated by Murray.[37] Since sulfonamide chemotherapy is of proved value in decreasing the incidence of infection in any wound, it will no doubt prove effectual in treating open wounds of blood vessels. A consideration of prime importance in maintaining the viability of an extremity following major blood vessel injury is the prevention and treatment of shock. The greater availability of blood for transfusion and human blood plasma for intravenous infusion will contribute greatly to a successful issue.

Traumatic disorders of the peripheral blood vessels may be classified as shown in Chart I.

An intimate knowledge of the anatomy and physiology of the peripheral vascular system is required for the intelligent treatment of injuries to blood vessels. Acquaintance with the fact that one may safely ligate the splenic artery proximal to the anastomotic blood vessels in the gastro-splenic ligament, or that one may not safely ligate the femoral artery in Scarpa's triangle to control bleeding from an open wound of this artery in the femoral canal is as important as knowing that intima must be approximated to intima to obtain successful anastomosis of blood vessels. Dependence on collateral circulation without realization of the effect of trauma on the vasoconstricting sympathetic nerve fibers supplying this circulation may lead to failure. Traumatic irritability of the arterial wall and of the

CHART I. TRAUMATIC DISORDERS OF THE PERIPHERAL VASCULAR SYSTEM

I. Organic Lesions of Traumatic Origin
  A. Closed Wounds
    1. Arteries
      a. Contused
      b. Thermal
      c. Chemical
    2. Veins
      a. Contused
      b. Thermal
      c. Chemical
      d. Effort
      e. Muscular strain
  B. Open Wounds
    1. Arteries
      a. Penetrating or puncture
      b. Perforating
      c. Incised
      d. Partially ablating or avulsed
      e. Completely divided
    2. Veins
      a.-e. Same as arteries

II. Functional Disorders of Traumatic Origin
  A. Arteries
    1. Vasoconstriction
      a. Following any traumatic organic lesion of artery
      b. Following trauma but no demonstrable organic lesion of artery present
      c. Frostbite
  B. Veins
    1. Valves—impaired function as a result of organic traumatic lesions of the vein.

sympathetic nerve ending may cause such severe vasospasm that arterial flow becomes entirely inadequate.

The etiology of these wounds may range in character from minor almost unexplainable, trivial traumas to severely damaging forces. Contusion or bruising of blood vessels most often follows direct trauma, such as blows or crushing injuries. Both contusion and lacerations are associated so frequently with fractures that careful examination to determine their presence or absence becomes mandatory in every fracture case. The blood vessels may be contused by the bone fragments, stretched by displacement, or penetrated by splinters of bone. Dodd[8] has shown that blood vessels are injured most frequently when the fracture occurs at a site where the blood vessel is relatively immobile so that it cannot escape contusion. Vascular injuries are more common in the lower extremity due to the proximity of the blood vessels to bone and their fixation in fascia and aponeurosis such as the inguinal ligament and adductor canal. The ease with which the brachial artery may be injured in supracondylar fractures of the humerus is well known. Femoral thrombosis may follow fracture of the neck of the femur, as noted by Watson-

Jones.[32] Heat may cause thrombosis of peripheral vessels but cold produces more commonly an effect on these structures. Freezing may cause the functional disturbance of chilblains or the organic catastrophe of gangrene from thrombosis of the blood vessels.

Thrombophlebitis of veins following intravenous infusions of sodium chloride or glucose is not at all rare. Thrombosis of the axillary vein has been ascribed to effort by many contributors to literature. A number of cases have been reported by Gould,[11] Barker[3] and Matas.[33] Kaplan and Katz[16] considered this condition a definite clinical entity but felt that the etiology has not been proved. Indirect trauma, in their opinion, however, plays a leading role. Homans[34] stated that a slight strain of the calf muscles may cause thrombosis of the deep or perforating veins. He believes that this frequently unrecognized thrombosis is the source of pulmonary emboli in many instances. Sprains of the ankle have been reported by Vance[31] and Martland[21] as the only attributable etiology of thrombosis of the deep veins of the leg in which pulmonary embolism and death occurred.

McCartney,[36] in a paper on pulmonary embolism, drew certain general conclusions. Those which are pertinent to this discussion are as follows:

1. Post-traumatic thrombosis and embolism are rather common.

2. The source of the embolism is usually at the site of the injury.

3. Prolonged immobilization and rest in bed necessary for repair of fractures of the long bones of the lower extremities promote stasis and the possibility of a resulting thrombosis.

4. Fracture of the femur is the most common cause of post-traumatic pulmonary embolism.

Twenty-eight cases or 3 per cent of 1.011 cases of thrombophlebitis reviewed by Barker[3] were traumatic in origin. These were caused by tearing, crushing fractures, tight casts and bandages. Injury of the axillary vein from pressure of crutches or following dislocation of the head of the humerus is fairly common.

Perforation or puncture of both arteries and veins are produced by bone fragments, shotgun pellets, small calibre gun missiles and sharp-pointed weapons of small diameter. Laceration and complete division are caused by knives, gunshot discharges at close range, bomb and shell fragments, shrapnel and sharp fragments of bone.

The continuous use of rapidly vibrating tools such as the pneumatic hammer or stone cutters' chisel results in increased irritability of the arterial wall and sympathetic nerve ending to such a degree that vasoconstriction ensues. The affection may become sufficiently advanced to produce necrosis of the finger tips.

Peripheral arterial disease, whether due to trauma or other causes, may be organic or functional. Organic and functional disturbances may be present at the same time in the same artery. Organic disorders include all diseases arising from pathological alterations in the wall of the vessels, in the lumen, and extra-arterial lesions which compress the arteries. Functional cases include all those diseases in which circulatory disturbances arise from abnormal influences upon the vasomotor system. The organic disturbances consist of inflammatory diseases, degenerative diseases and those producing mechanical obstruction. Degenerative diseases are of interest in this discussion since knowledge of their existence prior to trauma is important in prognosis as well as treatment. Although various grades of inflammation of arteries may follow injury, it is in the production of mechanical obstruction that trauma plays the greater part. Thrombosis, embolism, external pressure by bone fragments or hematoma and ligation are the factors which produce obstruction. Hemorrhage is the result of open vascular wounds but to be controlled must be influenced by one of these factors unless successful anastomosis or suture has been accomplished.

Trauma usually produces a vasoconstriction when the vasomotor system is involved. Acute segmentary vasospasms in which there has been no actual injury to the blood vessel have been reported by Montgomery and Ireland[28] and Kroh.[17] A bullet may enter an extremity and lodge near the major artery producing only slight extravasation of blood by no means sufficient to produce pressure on the artery. A spasm of the artery and its collaterals follows and produces occlusion of these vessels. The extremity becomes pale, cold, lifeless and pulseless. Lewis[20] called the condition "local arterial spasm associated with impact." Acute vasospasms which may become chronic leading to atrophy and causalgia-like conditions may follow many forms of trauma. According to Leriche[25,19] an obliterated artery ceases to be an artery and becomes a diseased plexus of sympathetic nerve fibers provoking distal vasospasm in the anastomotic network of blood vessels. Homans[35] believes a vicious reflex may follow vascular injury to such a degree that changes in skin, nerves, muscles and joints, with dystrophy and osteoporosis may occur. Pneumatic hammer disease,[25] miners' hands, and stone cutters' disease are functional vasomotor disturbances of occupation.

According to Bailey,[1] the sequelæ of localized contusion to an artery are thrombosis, embolus, secondary hemorrhage following arteritis with a weakened wall and aneurysm.

Hemorrhage from puncture of perforating wounds frequently subsides spontaneously whether or not there exists a communication to the outside through a break in the skin. Contraction of the opening in the artery by constriction of the vessel itself takes place, a blood clot plugs the opening, and thrombosis follows. If no communication with the outside exists, a hematoma may form and bleeding is stopped by extrinsic pressure on the artery. If the hematoma is large the pressure may be great enough to occlude the artery and its collateral and thus produce gangrene distal to the hematoma. The hematoma may later develop into a false aneurysm.

From complete division of an artery, massive hemorrhage is frequent. However, spontaneous cessation of bleeding may ensue, especially when the edges of the

divided vessel are rough and uneven, by contraction of the vessel and the production of a tack-like clot. If there is no external communication, bleeding may be stopped by the hematoma which invariably forms after complete division of an artery. When external communication through a break in the skin and the tissues surrounding a divided artery exists, hemorrhage is usually great and loss of life frequent. The size of the external wound is a factor in spontaneous stoppage of bleeding. Occasionally extensively damaged tissue and muscle may close the opening in the vessel, at least temporarily.

The end results of trauma to peripheral veins are obstructive or non-obstructive in character. Thrombosis may follow both open and closed wounds. Inflammation commonly is associated with the thrombosis. The obstruction to venous return may be intrinsic and be caused by pressure of a hematoma or bone fragments. Non-obstructive lesions are arteriovenous fistulæ and rupture. The former is caused most often by a penetrating wound of an artery and its concomitant vein. Rupture, as in arterial trauma, occurs in the weakened or infected contused wall of the injured vein.

The immediate results of trauma causing open wounds of veins are hemorrhage and air embolism. Hemorrhage from a vein is usually less serious than that from an artery, spontaneous cessation of bleeding occurring frequently. However, in certain anatomic positions serious venous hemorrhage is often more embarrassing than arterial bleeding. Such situations are the splenic pedicle, renal pedicle, root of the neck, near the jugular bulb and deep in the pelvis. Air embolism is more serious and not infrequently fatal. The most dangerous areas in which fatal air embolism may follow vein injury are the sites just above and below the clavicles.

The immediate formation of a swelling or tumor which may increase in size or pulsate is indicative of hematoma. All suspected wounds of blood vessels should be carefully examined for extravasation of blood in the adjacent soft tissues. Massive infiltration of blood may first produce venous obstruction, followed by arterial occlusion, lymph stasis and finally gangrene. Shock may obscure and make the signs of occlusion of the blood vessels difficult to elicit. The area should be ausculated to determine the presence of a bruit. Collapse or distension of the superficial veins occurs.

Early subjective symptoms of arterial occlusion are numbness, tingling, pain, paresthesia and anesthesia. Early objective findings may be pallor, cyanosis, absent normal pulsations and paralysis. Gangrene may occur early or late. Later effects of arterial obstruction are atrophy of the muscles, contracture, ischemic neuritis, osteoporosis, trophic edema, trophic ulcers and skin changes.

Leriche[18] has classified the disturbances which may follow ligature of the main artery to an extremity as follows:

1. A mechanical syndrome grading from massive gangrene down to localized necrosis in muscles, causing orthopedic troubles later.

2. Functional disorders such as intermittent claudication.

3. Vasomotor disorders with cyanosis, trophic troubles and muscular paresis.

Signs of venous obstruction are swelling of the extremity, edema and cyanosis. If the obstruction is due to thrombosis in the vein, the thrombus may be palpable. When phlebitis is associated, tenderness may be elicited. The superficial veins may be collapsed or dilated. Pain is often a prominent symptom of thrombophlebitis. There is usually increased temperature of the extremity. Late manifestations are brawny induration, pigmentation of the skin, ulceration and persistent stasis edema.

Since the usual functional disturbance following trauma to arteries is vasoconstriction, the symptoms and signs of this condition are those of occlusion. Acute traumatic segmentary vasospasm of the femoral artery will produce a cold, lifeless and pulseless extremity which may become gangrenous. In pneumatic hammer disease, circulatory arrest is initiated usually by cold weather. The fifth and fourth digits of the left hand are most frequently involved. Actual necrosis of the fingertips may be caused by the long continued vasospasm.

Michiner[25] stated that the failure to recognize early injury to blood vessels may result in the gradual appearance of some kind of traumatic aneurysm. Symptoms of this condition are fullness and tiredness of the extremity with pain and edema distally. A bruit and thrill may be present. Pulsations distally in the veins occur. A persistent tachycardia not explained by fever or infection should cause one to look for the presence of an aneurysm.

Immediate control of hemorrhage following open vascular wounds is a consideration of first importance, often as a life-saving measure. There is no doubt that the application of the tourniquet has saved many lives, but it is also true that the tourniquet has contributed to or has been the cause of the loss of many limbs. This means of controlling hemorrhage should not be used indiscriminately but only when large arteries are lacerated or traumatic amputation of an extremity has occurred. Bailey[1] gave the indications for the employment of the tourniquet as: (1) primary arterial hemorrhage which cannot be controlled by a firm pad and bandage or digital pressure; (2) reactionary and secondary hemorrhage; and (3) to render an operative field bloodless. When it can be used, the blood pressure cuff is the best tourniquet, since pressure is applied to a wide surface and may be adjusted easily. Venous bleeding can nearly always be controlled by a firm pad with bandage and elevation of the extremity. In using a tourniquet, one must avoid excessive as well as inadequate pressure, imperfect fixation, prolonged fixation, undue manipulation and injury to the skin. Where there is an open wound of a blood vessel with communication with the outside and ligation or repair cannot immediately be done, the application of artery forceps would seem more desirable than prolonged use of a tourniquet.

If there is no frank external hemorrhage from an

open wound, treatment of arterial injury must be directed toward the correction of one or more of the following conditions: thrombosis, hematoma and vasoconstriction. Thrombosis of an artery following contusion should nearly always be treated conservatively by attempting to increase the collateral circulation. If these methods fail, arteriectomy as advocated by Leriche[20] may be contemplated. In most instances it is not feasible to remove the thrombus since recurrence invariably follows. Where heparin can be used, this may not be true. When it does seem desirable to remove the thrombus, the incision in the artery should be made above the site of the thrombus. The clot may then be removed by forceps or suction.

Whether or not a hematoma should be treated conservatively often requires keen judgment. Surgical intervention is indicated, according to Bigger,[5] if: (1) continued or recurrent bleeding as indicated by increase in size of the hematoma occurs; (2) inadequate distal circulation persists in spite of attempts to obtain vasodilatation of the collateral circulation; and (3) large amounts of devitalized tissue are present. Pulsating hematomas may, however, heal spontaneously. If operation is necessary, a generous and adequate exposure should be made followed by evacuation of the hematoma and ligation of the artery just above and below the site of injury.

Since vasoconstriction may accompany any trauma of blood vessels, much should be done to overcome this physiologic and pathologic state whether surgery is necessary or not. The first step in this direction is the employment of appropriate methods to overcome shock. To prevent loss of an extremity from vascular injury, the blood pressure must be maintained above shock levels. The patient should be kept warm, but too much heat to the involved extremity is contraindicated when arterial trauma is present. The limb should not be exposed to temperature greater than 90 degrees Fahrenheit, according to DeTakats.[6] Heat may speed up local tissue metabolism to the point where the damaged vessels cannot adequately supply the increased demands for fuel, and gangrene results. Freeman[9] concluded that the extremity could be exposed to a temperature between 86 degrees and 93.2 degrees Fahrenheit without production of harmful effects. The extremity above the site of the injury as well as the body may be exposed to higher temperatures. Hot packs may be applied to the abdomen and upper thigh in injury of the popliteal artery, for example.

The limb should be placed in a dependent position, usually 10-15 degrees below the horizontal level. The position should be such that the tips of the toes or fingers retain their normal color. The use of tobacco should not be permitted. Vasodilating drugs, such as papaverin, sodium nitrite and nicotinic acid may be given. Alcoholic beverages may be helpful. The use of as much opiates as necessary to control pain is desirable. Local infiltration at the fracture site to overcome pain in those cases of blood vessel injury associated with fracture is desirable. This procedure has been employed at the Minneapolis General Hospital* and has been found beneficial in preventing and overcoming shock accompanying fractures. Paravertebral sympathetic nerve block, spinal anesthesia and local infiltration around the injured artery with procaine often overcome vasospasm by temporary paralysis of the sympathetic nerves supplying the arteries. Various types of negative and positive pressure producing apparatus may be used and intermittent venous hyperemia or occlusion may be employed. Where the vasospasm becomes chronic, various operative procedures on the sympathetic nerves have been advocated, such as sympathetic ramisection, paravertebral ganglionectomy, periarterial sympathectomy and arteriectomy. Periarterial sympathectomy and arteriectomy do not seem entirely rational and are performed by few neurosurgeons. Preganglionic ramisection is considered by many neurosurgeons the procedure of choice because the denervated smooth muscle is less sensitive to adrenalin. There is some question about the justifiability of using any of these operative procedures since their effects are not permanent in every instance.

Acute traumatic segmentary vasospasm is seldom diagnosed without exposure of the involved artery. The exposure and application of warm saline packs usually produces vasodilatation of the constricted portion of the artery. Pneumatic hammer disease disappears on change of occupation unless the condition has become chronic. In treating frostbite one should keep in mind that vasoconstriction is a prominent phenomenon. Employment of the methods outlined above to produce vasodilatation may be beneficial. In addition to these methods, Bertocchi[4] reported at a symposium on injuries caused by congelation the value of short wave diathermy in treating frostbite.

While there is considerable argument concerning the relative merits of ligature and suture, there are certain principles in the treatment of open vascular wounds which are accepted by most surgeons. An open wound of a vessel which is visible should always be ligated or repaired whether or not there is bleeding. However, one should not interfere primarily with an injured large vessel not visible in the wound when bleeding seems controlled and viability of the extremity distally is not endangered. It is better to permit the formation of a hematoma and a false traumatic aneurysm. These conditions can more safely be treated at a later date.

When there is absolutely no chance to preserve an extremity or its functional value, amputation should be done immediately. Following severe injury to an extremity, this procedure is often necessary to save life. When restoration of the limb can be expected following major blood vessel injury, ligation or suture should be practiced. Considerable difference of opinion is present among surgeons as to the advisability of suture during warfare. Mitchiner[25] considered suture not justifiable in the majority of cases since it requires a long operation, too frequently results in thrombosis at the suture line and arterial or arteriovenous aneurysms too often develop. Bigger[5] believed that vascular suture was not feasible in World War I since contamination was great and there was profound shock present in most instances. In his opinion the procedure was time-consuming, the danger of secondary infection was

*Fracture Service, Minneapolis General Hospital, A. A. Zierold, Chief.

great and, in many cases, there was too much damage to the vessel wall. In World War I, most American, British and French surgeons were of the opinion of Bigger and Mitchiner. German surgeons, however, according to Matas,[28] attempted suture frequently. In the present war, Wenzl[35] has answered the question of whether the present World War has definitely decided in favor of the necessity of the suture of blood vessels in the affirmative. He compares the advantages of suture and ligation of the blood vessels. Gangrene will occur in a certain percentage of cases in which the vessels have been ligated. DeTakats[7] gave the following figures for development of gangrene after ligation at the following sites: the subclavian artery in 9.7 per cent of the cases; the axillary artery, 9.8 per cent; the brachial artery, 3.1 per cent; the common iliac, 100 per cent; the external iliac, 13.4 per cent; the femoral artery above the profunda branch, 21.8 per cent; the femoral artery below the profunda branch, 10.4 per cent; and the popliteal artery, 37.2 per cent. Wenzl[35] found at the dressing stations and fields hospitals that gangrene always developed following ligation of the popliteal artery. In those instances in which the extremity escapes gangrene, the functional disturbances following ligation may be so great as to produce a painful, useless extremity. Murray,[27] in using heparin after vascular suture, had 80 per cent of the blood vessels remain patent. When venous transplants were used, 70 per cent remained patent. The use of sulfonamides locally may reduce the incidence of infection and thereby decrease the danger of secondary hemorrhage. According to German authors, suture reduces mortality as well as the incidence of gangrene and functional incapacity. Nevertheless, it would seem that arterial suture should be employed only under the most favorable circumstances, in clean wounds and by those skilled in its technique. Preferably ligation should be performed in most instances and measures taken to establish and maintain an efficient collateral circulation.

When ligation is elected as the procedure of choice in treatment of an open wound of an artery, it is suggested that the following points be observed:

1. The ligatures should be placed close to the site of injury, otherwise there is danger of hemorrhage from branches of the artery.
2. The injured portion of the artery should be excised.
3. Non-absorbable material should be used for ligature in most instances.
4. At least three ligatures should be used, two proximally and one distally.
5. The concomitant veins should be separately ligated as first suggested by Makins in 1917. Holman and Edwards,[13] on the basis of experimental evidence, found ligation of the vein proximal to the site of arterial injury produced better results than the ligation of the vein at the same level as the artery. Venous pressure is increased by this procedure and as a result collateral circulation is stimulated.
6. Following ligation, every effort should be made to increase collateral circulation.

Reid[30] has made excellent suggestions in the technique of ligature. He advised: (a) when ligating arteries, less damage will be done to the arterial wall if the vessel is temporarily occluded proximally and distally during the procedure of pulling the ligature tight, (b) the size of the ligature should vary directly with the size of the artery, (c) one ligature on a large artery should be anchored, (d) one should not cover or bury ligatures of arteries in an infected or potentially infected wound, and (e) no catgut should be used.

In lieu of ligation or suture, Bailey[1] has suggested the use of a glass canula with general heparinization as a temporary expedient in dealing with wounds of large blood vessels. This is a revival of the principal of the Tuffier tube which was a paraffin-coated silver tube which ideally maintained blood flow until adequate collateral circulation developed.

Secondary hemorrhage may follow any blood vessel injury when infection supervenes, usually ten to sixteen days after injury. Shock is severe and entirely out of proportion to the amount of blood lost. As emergency measures, bleeding may be controlled by tourniquet, pressure or packing. Shock should be treated immediately. Later the bleeding vessel may be ligated close to the source of bleeding. Proximal ligation is considered futile. The infected clot is removed and the vessel ligated with silk or tape, the ends of which are brought out of the wound. Where bleeding is not serious, packing may suffice. Whether packing or ligature is used, the extremity should be immobilized. The packing may cautiously be removed at the end of forty-eight hours, while the sutures are left in place for two weeks or more.

When a traumatic aneurysm has developed, sufficient time should be allowed to elapse for the establishment of adequate collateral circulation, usually three to six months. Essential treatment of traumatic false arterial aneurysm is proximal and distal ligation of the sac, while that of arteriovenous aneurysm is quadrant ligation. In rare instances, establishment of circulation may be attempted.

The treatment of closed venous injury is mainly that of phlebothrombosis or thrombophlebitis. Prophylactically prolonged immobilization should be avoided wherever possible following trauma. DeTakats[6] considers rest necessary for only a short period in cases of thrombosis of the superficial veins, since rest may favor or produce thrombosis of the deep veins. When it appears that the thrombosis is ascending, ligation of the saphenous vein at the sapheno-femoral junction is advised.

When the deep or perforating veins are involved, strict bed rest is necessary until temperature and pulse are normal. Heat should be applied and the leg elevated. The vein may be ligated above the site of the thrombus to prevent embolism. Paravertebral sympathetic nerve block with procaine, popularized by Ochsner and DeBakey,[29] especially when done repeatedly may bring symptomatic relief as well as hasten subsidence of inflammation and edema. Heparinization will prevent, according to those who have used it in a large number of cases, spread of the thrombosis. Occa-

sionally actual suppuration of an acute post-traumatic thrombophlebitis may take place with the formation of abscesses. These abscesses must be drained as they occur. Chemotherapy of phlebitis may do much to prevent this condition.

Bleeding from open wounds of veins may be controlled by: (1) pressure; (2) by leaving applied artery forceps in place for forty-eight hours; (3) by packing, although the contiguous artery may be damaged by this procedure; (4) by fine ligature; and (5) suture. When air embolism occurs, the circulation is embarrassed by air in the right auricle and in the small blood vessels of the lungs. Measures which have been suggested to overcome these conditions are aspiration of the right auricle, cardiac massage, catheterization and removal of air through the jugular vein and persistent artificial respiration.

Summary

1. A classification of traumatic disorders of the peripheral vascular system has been attempted.
2. A review of the etiology, physiology and pathology has been presented.
3. Suggestions for treatment of these disorders, stressing particularly the importance of overcoming vasoconstriction, have been made.

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THROMBOSIS OF THE AXILLARY VEIN

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Primary thrombosis of the axillary vein is a rather rare condition but is nevertheless a definite clinical entity. Veal found less than 150 cases reported in the literature up to 1940 and while this is probably not an indication of the incidence of this condition, the fact that only twenty-three authors reported more than one case up to that time appears to be significant.

A consideration of thrombosis in this location, as in others, on an etiological basis shows that four factors operate in the causation of this lesion.

1. Infection or other disease of the vein wall.
2. Trauma.
3. Venous stasis.
4. Altered state of the blood.

Acute thrombosis of the axillary vein produces a typical symptom complex, regardless of the etiology of the thrombosis. The more common signs and symptoms follow.

1. *Pain in arm and shoulder.*—This may be slight but usually is moderately or extremely severe. It is often described as a sense of soreness, or as a stinging or sticking sensation. Associated with local pain is tenderness which in general extends along the course of the involved vein.

2. *Edema.*—There is usually some redness and local swelling over the involved segment of the vein, often described as a lump, or better, a cordlike mass but in addition to this there is usually a generalized edema

of the extremity due to congestion of the entire venous and capillary bed distal to the site of blockage. The size to which this swelling develops is dependent upon the degree of involvment of the vein as well as the rate of establishment of collateral circulation.

3. *Weakness and partial loss of function of the arm.* —This is dependent upon the extent, duration and acuteness of the involvement, it being more severe as edema occurs and increases.

4. *Preservation of the radial pulse.*

5. *Elevation of systolic pressure on the affected side.*

6. *Fever may or may not be present.*

7. *Tachycardia* is a frequent sign even in the abscence of fever. If persistent, it is considered evidence of continued activity of the disease.

The essential pathology of thrombosis of the axillary vein is that of obstruction of the return flow of blood from the hand and arm, vasospasm, an increase of local venous pressure and an escape of fluid into tissue. As a rule the process is not confined to the axillary vein alone but involves to some extent the subclavian, the basilic and brachial veins, occasionally the external jugular and rarely the internal jugular vein. The entire thrombus may be absorbed or it may become organized and permanently obstruct the vessels. Recanalization of the lumen may occur but this is usually incomplete and the return circulation must be carried on by the newly developed collaterals.

Veal[5] has classified thrombosis of the axillary vein as follows:

1. Primary thrombosis.
   (a) Thrombophlebitis, bacterial invasion.
   (b) Phlebothrombosis, aseptic traumatic, or effort thrombosis.

2. Secondary thrombosis.
   (a) Thrombophlebitis from regional infection.
   (b) Thrombosis from malignancies of the axilla and chest.

(3) Post-thrombotic syndrome.

True thrombophlebitis of the axillary vein is an exceedingly rare condition when compared with the frequency of its occurrence in the vessels of the lower extremity. There are probably two reasons for this variation. The most important is the rapid emptying of the venous system of the arm by almost continuous use of the limb and, secondly, because of the shortness of the course through which the blood must flow, stasis being unusual. This condition presents definite constitutional and local signs, namely elevation of temperature, acceleration of pulse and leukocytosis. It occurs most often in cardiac patients in whom there is slowing of venous blood flow. Phlebitis may be secondary to some regional infection or from malignancies of the axilla or chest.

In a study of approximately sixty cases of postoperative edema of the arm, following radical mastectomy for carcinoma of the breast, Veal[6] found that the cause of the edema was an obstruction of the venous return from the arm in about 90 per cent of the cases. The obstruction in some was the result of scar formation, in others direct involvement of the axillary or subclavian vein by the carcinoma. In an effort to reduce the incidence of obstruction of the vein due to scar formation it has been our custom to preserve a small portion of the pectoralis major and minor which is sutured in place over the vein. There is less possibility for the development of adequate collateral circulation after radical mastectomy because, due to the nature of the operation, the acromiothoracic, often the long thoracic and sometimes the cephalic vein has been sacrificed.

Phlebothrombosis (aseptic traumatic or effort thrombosis). This group is made up of sterile or non-bacterial thrombosis and includes the so-called "effort" thrombosis. This condition occurs in healthy individuals; males predominate in a ratio of 4 to 1 and the right arm is involved in a proportion of 25 to 1. The onset is usually quite acute but may be gradual. Pain is the first symptom, and swelling of the hand and arm develops rapidly. There is an associated arterial spasm which may cause the hands to feel cold and numb and produce a slight cyanosis of the fingertips. The arterial pulse can be easily palpated. Along the inner surface of the upper arm a firm, tender, cordlike mass can be felt extending up through the axilla and to the chest wall. Usually this cord involves the basilic, the brachials and the axillary, and sometimes the jugular veins. The maximum swelling usually occurs in twenty-four hours after onset and persists from a few days to a month or longer. As the edema subsides there is evidence of superficial venous collaterals developing over the upper arm, shoulder and anterior portion of the chest wall.

The explanation of the occurrence of a thrombosis following a direct crushing injury to the axillary vein is obvious. However, only a few of the cases reported have followed such an accident. Rowing a boat, tests of strength, baseball, lifting, as well as many other activities, some of which are actually trivial, have preceded the formation of a thrombosis. In some instances this condition has occurred during a patient's sleep without history of injury or trauma.

Veal,[7] following a series of experimental studies on cadavers as well as on living subjects by means of venograms and axillary venous pressure readings during forced respirations, concluded that (1) the axillary vein was markedly compressed over the subscapularis muscle and beneath the head of the humerus with the arm in a position of abduction; with an actual stretching of the axillary vein proximal to the point of compression, and (2) that respiratory effort might cause considerable distention of the axillary vein particularly if there was any interference with back flow through connecting vessels. He feels that injury to the vein wall may readily occur during compression, stretching or distention, or a combination of two or three factors.

Injury to a vessel, whether it is traumatic, inflammatory or thermal may cause a spasm or contracture of that vessel. Venospasm may result from sympathetic irritation. During the period of spasm the lumen of the vessel may be almost occluded and cause a marked retardation of blood flow.

Whatever the mechanism, it is essential that there is some damage to the vessel wall, and then a slowing down of blood flow for the production of a thrombus. The injury may be to the intima, the valves or the entire vein wall may be damaged.

Although the acute stages of thrombosis rapidly subside, the altered physiology of the circulation may not be corrected. There may remain sufficient obstruction to the venous return to produce more or less permanent symptoms. The severity of these symptoms depends upon the degree of the formation of collateral circulation. Regardless of the type, this follows a more or less definite course depending chiefly upon the extent of the thrombosis. When it does not extend beyond the axillary vein the development of collaterals is rapid but when the thrombosis is more widespread it occurs more slowly. The important tributaries taking part in this process are the superficial veins over the anterior shoulder and chest, the veins following the acromiothoracic artery, the long thoracic and the cephalic vein. As the acute process subsides, there appear newly developed collaterals over the shoulder and upper arm and the edema disappears. There are no further symptoms while the arm is at rest but following exercise or prolonged use of the involved limb, the patient may feel a sense of fulness, weakness, fatigue or actual pain in the arm and shoulder. In some cases there may be a recurrence of the edema following prolonged exercise. The duration of this post-thrombotic syndrome is variable and at times may even be permanent.

Matas[1] has emphasized the importance of these residual symptoms and has called attention to the possible medico-legal aspects that may confront one in the management of such cases.

Treatment.—The conservative treatment of thrombosis of the axillary vein consists of (1) rest in bed, preferably in a hospital; (2) immobilization and elevation of the extremity and the application of either ice bags or large hot packs with the latter definitely favored by most writers. Rest and immobilization should be continued until there is definite evidence of collateral formation. Sulfonamide therapy has been used but in the absence of infection is hardly indicated and the results are variable.

The use of the technique of sympathetic ganglion block with procaine hydrochloride as a conservative form of therapy has been advocated by Ochsner and DeBakey. It is based on the fact that vasospasm is frequently one of the most important factors in phlebitis from the viewpoint of production of pain and disturbance by affecting nearby veins and arteries. The object of this procedure is the reëstablishment of the normal exchange of intravascular and perivascular fluids and a breaking up of a viscious circle.

The technique for this procedure is to inject the stellate ganglion by the anterior approach as recommended by Ochsner[4,5] as follows, I quote, "A point 1 cm. medial to the midpoint of the clavicle is chosen and an intracutaneous wheal of novocain is made in the skin immediately over the upper border of the clavicle. A fine lumbar puncture needle is introduced on a horizontal level with the clavicle and directed posteriorly and medially at a 45-degree angle with the midline. The point of the needle, after being introduced for a distance of 6 to 7 cm., impinges against the anterolateral surface of the body of the seventh cervical vertebra or at the junction between seventh cervical and first thoracic vertebræ, where the stellate ganglion lies. After ascertaining by aspiration, that the needle is not in a vessel, 10 c.c. of 1 per cent novocain is introduced. A satisfactory injection is determined by the presence of Horner's syndrome, anhydrosis, and increase in warmth of the extremity on the injected side." End of quotation.

There are no known surgical measures which will completely relieve thrombosis of the axillary vein. Surgical exploration has been undertaken in a few cases but the end results do not justify further attempts. In certain cases in which thrombosis is extensive and in which there is an extreme degree of edema, multiple skin punctures may prove helpful. This procedure must be done under strictly aseptic conditions.

Case Reports

Case 1.—W. L., a single male student, aged twenty-one; was admitted to the hospital on April 24, 1937.

He gave a history of two unusual physical exertions involving the right arm, baseball and a test of strength with another boy. Two days later the arm, forearm and hand became swollen, although not painful. Pain did not develop until six days later, the day preceding admission.

On examination, the right arm, forearm and hand were moderately swollen. There were several recent blisters on the forearm from the application of hot packs. The hand was quite red with a suggestion of cyanosis. The median basilic and cephalic veins were dilated as well as the superficial veins over the upper arm and shoulder. The thrombosed axillary vein was readily palpable and very tender. The radial pulse was strong. Temperature was normal and remained so. Pulse was 70 and respirations, 18.

X-ray examination of the upper extremity was normal. There were no other abnormal physical findings.

Diagnosis.—Thrombosis of right axillary vein.

The arm was kept in a state of complete rest, in an elevated position and with a continuous application of hot packs for fifteen days with complete disappearance of all signs and symptoms. He was discharged from the hospital on May 12, 1937, his eighteenth hospital day, with his arm in a sling.

His convalescence continued uneventfully and when last seen six months after discharge he had a perfectly normal anatomical, physiological and functional condition of the right upper extremity and axilla.

Case 2.—Mrs. W. W., a forty-seven-year-old housewife, was admitted to the hospital on September 15, 1941, giving a history of the onset of discomfort in the left axilla several days ago which actually became painful yesterday and at that time she noted a tender, reddish, cordlike mass in the axilla.

Examination showed a moderately firm, discolored, tender, swollen left axillary vein. There was no swelling of the remainder of the extremity. The radial pulse was strong. Temperature was 98.4°, pulse, 70 and respirations, 18. The white blood count was 9,000. All other laboratory and physical findings were normal.

Diagnosis.—Thrombosis of left axillary vein.

The arm was elevated, immobilized and ice packs applied thereto. This therapy was maintained for ten days with a gradual reduction in size of the axillary vein and a disappearance of all discoloration. The extremity was very gradually mobilized and the patient was discharged from the hospital with the arm in a sling on October 6, 1941, her twenty-first hospital day. There has been no recurrence.

Case 3.—Mr. E. H., single, a twenty-one year old shipping clerk, was admitted to the hospital on June 16, 1941, giving the following history.

About three weeks preceding admission, he had pain, swelling and redness of the right upper extremity after pitching and curving a ball. He consulted a doctor who advised hot packs which the patient applied evenings as he continued to work. The soreness gradually subsided but there was still stiffness and some residual swelling present yesterday when he again threw a ball, this time very cautiously. He has had a recurrence of the pain, swelling and redness of the entire right upper extremity today.

Examination showed the right upper extremity to be markedly swollen, edematous and red, the fingers being cyanotic. There was also swelling and redness over the anterior chest wall. There was a large, very tender, cordlike mass extending through the axilla from the chest wall well down onto the forearm. The right biceps measured 12⅝ inches and the left, 11 inches; the right forearm, 11¼ inches and the left 9⅞ inches. The radial pulse was strong. Temperature was 99.4°, pulse, 88 and respirations, 20. The white blood count was 12,000. There were no other abnormal findings.

The patient was put to bed with his right arm elevated and immobilized. Large ice packs which later were changed to hot packs were applied. He was placed on sulfathiazole. During the first ten days he received only partial relief from his pain and the extremity remained swollen but from that point on there was a slow but steady improvement. He was discharged on July 19, 1941, his thirty-third hospital day, his right biceps still 2 inches greater than the left and the forearm 1 inch greater.

He was observed at the office for the following five months during which period the swelling receded still more and he was allowed more and more activity. He had some difficulty on returning to work because of pain and weakness.

When last seen he had just enlisted in the army air corps, his right arm still somewhat swollen but comfortable as long as his activity was not too strenuous.

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Discussion

DR. RICHARD CRANMER: Dr. Anderson has said that heat applied to a thrombosed vessel stimulated the metabolic processes in the vicinity of that vessel and sometimes because of that there was a sloughing. Dr. Hoffert has used both heat and cold in the presence of thrombosis and my question to him is, "What, in his opinion, is the comparative value of the two as he has observed it?"

DR. HOFFERT: I believe that in general the application of moist heat is more effective than the application of cold in the treatment of this lesion in addition to being more comfortable to the patient. In those instances in which the application of cold is resorted to, I do not think it wise to apply it continuously, but it is better to apply it at intervals of an hour. Some prefer to alternate between the application of heat and cold.

Vitamins have little effect on wound healing, according to Dr. Edward L. Howes of Columbia. Extreme vitamin C deficiency may delay wound healing. Early débridement is the only way to remove contaminants, and a pair of scissors, some novocaine and a look inside of every traumatic wound is essential to good surgery. These procedures must not be abandoned in favor of any magic powder. About 10 per cent of wounds have streptococcus contamination when first seen and another 60 per cent which must be treated as open wounds receive streptococcus contamination from the human attendant unless strict asepsis is observed. Sulfonamide powders are desirable in handling an open wound.

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In Memoriam

Thomas Chalmers Clark

Dr. T. C. Clark, formerly of Stillwater, died June 19, 1942, at Washington, D. C., where he had lived for the past three or four years.

Dr. Clark was born in Quincy, Massachusetts, April 22, 1853, the son of Rev. Nelson and Elizabeth Gilman Clark. He was educated in the public schools of that state and at Bristol Academy, Taunton, Massachusetts, graduating in 1870. That same year he came to Stillwater, Minnesota, and taught school until 1877 when he began to study medicine under Dr. W. H. Pratt. He graduated from Rush Medical College, Chicago, as valedictorian of his class in 1881.

Dr. Clark was a member of the Washington County Medical Society, the Minnesota State and American Medical Associations, the Association of Military Surgeons of the United States and was a charter member of the Minnesota Public Health Association. He was actively identified with the Minnesota National Guard for twenty years, a major and surgeon of the 12th Minnesota Volunteer Infantry and surgeon in charge of the Third Division Hospital of the First Army Corps in the Spanish American War.

Dr. Clark was a member of the First Presbyterian Church of Stillwater and was active in the Masonic Order. He was also a member of the Sons of the American Revolution. For a number of years he was the physician at the Soldiers Home.

Dr. Clark was much interested in tuberculosis and worked hard in the early anti-tuberculosis campaign. In 1902 he submitted to the Washington County Medical Society the resolution approving the establishment of a tuberculosis sanatorium by the state. A bill drawn by him in conjunction with Dr. Harper Workman of Tracy was presented to the legislature but was defeated when a legislator stated it was for the benefit of the doctors only.

Dr. Clark was married in 1882 to Sarah A. Stevens of New York City. His wife died in 1899. Later he married Mary R. Breckenridge of Decorah, Iowa, who also preceded him in death. He is survived by three sons, Stephens Clark of British Columbia; William G. Clark of Washington; Colonel Harold Clark of Washington; and a daughter, Julia Breckenridge Clark also of Washington.

Emily W. Fifield

Emily W. Fifield was born at Manchester, Iowa, January 30, 1858, the only daughter of Reverend L. B. and Emily J. (nee Walworth) Fifield. She attended public schools of Cedar Falls, Iowa, and Lincoln, Nebraska, and later was a student at South Hadley, Massachusetts, at Mount Holyoke and the normal school at Salem, Massachusetts. She received her medical education and graduated from the Women's Medical College at Baltimore, in 1884. During the remainder of that year and 1885 she did postgraduate work in Philadelphia and New York.

In 1885 Dr. Fifield started her medical practice in Minneapolis where she did general work, interesting herself largely in gynecology and pediatrics. She attended clinics and studied in Edinburgh and London in 1900. In 1901 and 1902 she continued her postgraduate study in Baltimore under the tutelage of Doctors Osler, Kelly, Russell and Simon. For many years she was physician in charge of the medical work at Bethany Home.

Dr. Fifield was unmarried. She was active in civic affairs, being particularly interested in the Y.W.C.A. She was a member of the Park Avenue Congregational Church until she retired in 1919, when she moved to Los Angeles, California, where she lived until her death September 22, 1941.

Leonard Forrest Woodworth

Dr. L. F. Woodworth, for thirty-one years a practitioner at Le Center, Minnesota, died June 18, 1942, of a heart attack at the age of sixty-two.

Dr. Woodworth was born January 30, 1880, at Shenandoah, Iowa. He received his M.D. from the University of Iowa in 1908 and soon began practice in Le Center. His early years of practice were in the days of poor roads and when the horse and buggy were largely required.

He was a member of the Scott-Carver County Medical Society until 1940, when he transferred to the Nicollet-Le Sueur Society. He was automatically a member of the Minnesota State and American Medical Associations. He was also a member of the St. Peter Knights Templars.

He had practiced in the same community for thirty-one years and his jovial disposition and friendly smile, as well as his readiness to serve his community, state and nation gained him many friends. He was deeply interested in conservation and took an active part in the Izaak Walton League, enjoying hunting and fishing. For many years he served as health officer and was chairman of the Boy Scouts for a period of years.

Dr. Woodworth married Bertha Fickling on September 9, 1914, in Le Center. Mrs. Woodworth died in 1936. One son, Leonard, was born to this union and is now in the flying service.

"DATED" VITAMINS

"Dated" vitamins may presently become necessary, as a result of the discovery that oxygen is an enemy of vitamin D. This discovery was reported by Dr. J. C. Fritz, Dr. J. L. Halpin, Dr. J. H. Hooper and Dr. E. H. Kramke of Borden's Nutritional Research Laboratory at Elgin, Ill. They found that vitamin D, both natural and synthetic, deteriorated on standing, and have evidence that oxygen in the air was the cause of the mischief. They were able to protect the vitamin by applying protective coatings to the substances on which it was adsorbed, or by placing it in containers in which air had been replaced by an inert gas.—*Science News Letter*, April 25, 1942.

REPORTS and ANNOUNCEMENTS

CIVIL SERVICE APPOINTMENTS

The United States Civil Service Commission announces available appointments for a rotating internship and for psychiatric residents in St. Elizabeth's Hospital, federal institution for the treatment of mental disorders in Washington, D. C. The positions pay $2,000 a year. Applicants for internship must be fourth-year medical students in a Class A medical school. Applicants for the position of psychiatric residents must have served or be now serving an accredited rotating internship.

The Commission also announces positions as Junior Public Health Nurse, with no age limits, at $1,800 a year. Registered nurses who have graduated since January 1, 1920, from an accredited school of nursing having a daily average of 100 or more patients and who have completed or are enrolled in an approved course covering one academic year in public health nursing, may apply.

Public Health Nurse positions paying $2,000 a year are also available for Indian service, including Alaska, and for the Public Health Service. Graduation from high school is no longer required for the public health nurse.

Those interested in any of these positions may secure announcements and application forms from the Commission's representatives at first-class and second-class post offices.

PHYSICAL THERAPY COURSE AT COLUMBIA

Columbia University announces that beginning September, 1942, a program of professional studies for the training of Physical Therapy technicians will be offered. This training and instruction will extend over a two-year period and has been organized in compliance with the requirements set down for such programs by the Council on Medical Education and Hospitals of the American Medical Association. The course is being set up in University Extension in close relationship with the College of Physicians and Surgeons of Columbia University, the Nursing Education and Health and Physical Education Departments of Teachers College. The clinical and laboratory instruction will be given at the Vanderbilt Clinic, Neurological Institute, Presbyterian Hospital and New York Orthopedic Dispensary and Hospital.

Two years or sixty semester hours of college, including courses in Physics and Biology, shall be required, or graduation from an accredited School of Nursing or an accredited School of Physical Education.

A Certificate of Proficiency in Physical Therapy will be granted by Columbia University to those completing the course. Further information may be obtained by writing the Office of the Committee on Physical Therapy, Room 303B, School of Business, Columbia University, New York City.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The Northern Minnesota Medical Association's annual meeting will be held at the Birchmont Hotel in Bemidji on Saturday, August 29, at 8:00 A. M. The meeting this year will consist of a one-day program and a banquet in the evening. The program is as follows:

"X-ray Diagnosis of Abdominal Disease"
Dr. C. B. Nessa, St. Cloud

"Shock Associated with Burns"
Dr. W. S. Neff, Virginia

"Lumbosacral Pain"
Dr. R. K. Ghormley, Rochester

"Miscellaneous Observations on the Diagnosis and Treatment of Anemia"
Dr. H. Z. Giffin, Rochester

"Acute Dermatological Conditions"
Dr. F. T. Becker, Duluth

The Pathological Conference conducted by Dr. E. L. Tuohy of Duluth, consisting of pathologists and men interested in various fields of medicine, will be held in the afternoon.

Those who attend are urged to bring their questions and problems along for discussion. Ample time will be allowed following each topic for full discussion, so come prepared to contribute as well as to take away ideas.

The local arrangements are in charge of Dr. T. P. Groschupf of Bemidji. A program of entertainment for the ladies is being arranged as well.

AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians has announced its 27th Annual Session to be held in Philadelphia, Pa., April 13 to 16, inclusive, 1943. Heretofore, the College has held a five-day session, but in the interest of conserving time and expense of its members, the program will be condensed into four days, Tuesday through Friday. The general management of the session and technical exhibits will be handled by the Executive Secretary, Mr. E. R. Loveland, 4200 Pine St., Philadelphia.

CENTER FOR STUDY OF INFANTILE PARALYSIS

The National Foundation for Infantile Paralysis has made a five-year, $300,000 grant to Johns Hopkins University for an intensive and long time study of infantile paralysis. It will be used to establish and conduct the Center for the Study of Infantile Paralysis and Related Viruses at Hopkins. The choice of Hopkins was made because it was felt that there the staff

of epidemiologists, virologists, serologists, neurologists and chemists required for a comprehensive study of the disease was already available. Work at the Center will be under the direction of Dr. Kenneth F. Maxcy, professor of epidemiology in the School of Hygiene and Public Health. The funds which make this research project of the National Foundation possible are contributed each year at the time of the national celebration of the President's birthday.

PUBLIC HEALTH FELLOWSHIPS

The Commonwealth Fund of New York, the foundation established in 1918 by the late Mrs. Stephen V. Harkness, has announced through the Pan-American Sanitary Bureau, the establishment of fifteen fellowships for a one-year study of public health subjects or postgraduate medical courses for properly qualified citizens of the other American republics.

The Pan-American Sanitary Bureau, the international health agency of the American republics already has nearly 100 Latin Americans studying medicine and public health in the United States.

MISSISSIPPI VALLEY MEDICAL SOCIETY

The annual meeting of the Mississippi Valley Medical Society, which embraces the states of Iowa, Illinois and Missouri, will be held at the Hotel Lincoln-Douglas, Quincy, Illinois, September 30, October 1 and 2, 1942.

The three-day program of lectures, clinics and instructional courses is especially designed for general practitioners and constitutes a short postgraduate course.

Membership fee and first year's dues of $5.00 include subscription to the official publication the *Mississippi Valley Medical Journal*. Annual dues thereafter are $3.00. Free registration is given to army and navy physicians.

For further information address Dr. Harold Swanberg, secretary, 209 W.C.U. Building, Quincy, Illinois.

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* * *

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* * *

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WOMAN'S AUXILIARY

MRS. RAYMOND J. JOSEWSKI, *President*
Stillwater, Minnesota
MRS. W. H. RUCKER, *Publicity Chairman*
Minneapolis, Minnesota

Mrs. Raymond J. Josewski of Stillwater was elected president of the Minnesota Woman's Auxiliary at the annual meeting held June 29, 30 and July 1 in Duluth, in conjunction with the meeting of the State Medical Association. She succeeds Mrs. John J. Ryan of Saint Paul, who presided at business sessions of the Executive Board and the state organization.

Other officers elected at the annual meeting are:
President-elect—Mrs. F. S. McKinney, Minneapolis
First vice-president—Mrs. Neil Dungay, Northfield
Second vice-president—Mrs. W. N. Graves, Duluth
Third vice-president—Mrs. L. P. Howell, Rochester
Recording secretary—Mrs. E. V. Goltz, St. Paul
Treasurer—Mrs. Henry Quist, Minneapolis
Auditor—Mrs. J. A. Thabes, Sr., Brainerd
Historian—Mrs. O. B. Fessenmaier, New Ulm

Honorary membership was conferred upon Mrs. James Blake of Hopkins because of her outstanding service to state and national auxiliaries.

The St. Louis County Auxiliary, hostesses to the visiting women, planned the program and made arrangements for all social events.

Convention visitors were guests at a tea at the Duluth Women's Club on the opening day and that evening joined the Medical Association for an informal dance and floor show at the Hotel Duluth. The Annual Meeting and luncheon which followed were held at the Northland Country Club. George S. Corfield, Professor of Geography at the Duluth State Teachers College, was the guest speaker. His talk, titled "Lands of the New World Neighbor," was timely, entertaining, and well-received.

Mrs. Frank N. Haggard of San Antonio, Texas, president of the national auxiliary, was a guest at the round-up breakfast on Wednesday morning.

It was felt that Duluth has excellent facilities for entertaining conventions and that the St. Louis County auxiliary deserves commendation for its hospitality and skillful handling of housing, transportation and program.

MRS. L. P. HOWELL,
Recording Secretary.

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OF GENERAL INTEREST

Dr. and Mrs. Carl Simison of Barnesville are the parents of a son born June 10.

* * *

A son was born to Dr. and Mrs. C. W. Jacobson of Thief River Falls, July 9. Dr. Jacobson is associated with the Bratrud Clinic in that city.

* * *

Dr. David P. Anderson, surgeon at the Austin Clinic in Austin, reported last month for duty at Fort George Wright, Spokane, Washington, where he is a captain in the medical corps of the air force.

* * *

Dr. and Mrs. E. G. Knight of Randall have moved to Swanville where Dr. Knight will practice for a limited time, as a young doctor has been declared necessary to that community during the emergency.

* * *

Dr. A. A. Schmitz, formerly of the Mesaba Clinic at Hibbing, has become associated with the Mankota Clinic in Mankato. Dr. Schmitz was graduated from the University of Minnesota Medical School in 1937.

* * *

A new faculty appointment at the University of Minnesota Medical School is that of Dr. Ferdinand L. P. Koch of Saint Paul who has been named clinical assistant professor of ophthalmology on a half-time basis.

* * *

Dr. Bayard T. Horton of Rochester presented a paper, "Headaches, Recent Advances in Treatment," at the seventy-fifth annual meeting of the West Virginia State Medical Association at Huntington, July 13-15.

* * *

A grant of $10,700 has been given the University of Minnesota by the National Foundation for Infantile Paralysis to support research on infantile paralysis being carried on by Dr. Herman Kabat, University of Minnesota physiologist.

* * *

Dr. H. R. Rice of Roseau reported last month to the Great Lakes Naval training station in Great Lakes, Illinois, for active duty in the navy medical corps. He holds the rank of lieutenant commander, and has been assigned to the surgical unit.

* * *

Dr. Earl Wood of Mankato has been named to do medical research in aeronautics for the government at the Mayo Clinic at Rochester. A graduate of the University of Minnesota Medical School, Dr. Wood has been on the staff of Harvard University Medical School's pharmacology department.

* * *

Commander T. B. Magath of the United States Navy, formerly of Rochester, spent a week in Rochester last month giving a series of lectures on tropical medicine at the Mayo Foundation. The lectures were for reserve officers of the United States Army and Navy who are in Rochester on special detail for training.

* * *

Dr. Edward Francis Walsh and his bride, the former Miss Alberta Ruth Schroeder, who were married in Saint Paul, June 27, are now living at Carlisle Barracks, Pennsylvania, where Dr. Walsh is a first lieutenant. He was graduated from the University of Minnesota Medical School in June.

* * *

The fourth-story addition to the main building of the Mineral Springs Sanatorium at Cannon Falls, was expected to be ready for occupancy about August 1. The new quarters are to be used for patients able to go to the dining room for meals, and also for rooms for employes.

* * *

Donald Duncan, Ph.D., associate professor of anatomy, University of Texas Faculty of Medicine, Galveston, Texas, has been appointed professor and head of the department of anatomy at the University of Buffalo School of Medicine, Buffalo. Dr. Duncan received his Ph.D. at the University of Minnesota in 1929.

* * *

Dr. A. E. Henslin who has been in practice in LeRoy for almost a half a century—since 1893—was guest of honor at a party given by members of the Rebekah and Odd Fellows lodges on his seventy-seventh birth anniversary. Dr. Henslin, who was born near Racine, June 20, 1865, has been a member of the lodge ever since he came to LeRoy.

* * *

Appointment of Commander W. McK. Craig of Rochester as chief of neuro-surgery in the Naval Hospital at the National Naval Medical Center in Bethesda, Maryland, is announced.

Commander Craig who has been stationed at the Naval Hospital in Corona, California, visited his family in Rochester for several days last month before proceeding to his new station.

* * *

Officers of the Southwestern Minnesota Sanatorium district were re-elected at the annual board meeting held in Worthington, July 3.

They are Dr. C. L. Sherman of Luverne, president; Edwin Brickson of Adrian, vice president; N. L. Zender, St. James, member of the executive committee.

Dr. S. A. Slater of Worthington, superintendent of the sanatorium, remains as secretary of the board.

* * *

Dr. Bernard Nauth has joined the staff of the Winona Clinic in Winona, to remain until such time as military demands take him away, it is announced by the clinic. Dr. Nauth is the son of Dr. Walter W. Nauth, long-time resident of Winona, and is a grad-

uate of the University of Minnesota Medical School. During the past year, he interned at San Bernardino County hospital in San Bernardino, California.

* * *

Staff promotions recently announced at the University of Minnesota Medical School by Dr. Harold S. Diehl, dean of medical science, follow:

Dr. Arild E. Hansen promoted from associate professor of pediatrics to professor.

Dr. Joseph T. King promoted from assistant professor of physiology to associate professor.

Dr. Herman Kabat promoted from instructor of physiology to assistant professor.

* * *

Dr. Edward G. Huber, assistant dean of the Harvard school of public health and chief of the orthopedic unit of the Massachusetts state department of health, visited in Winona, his boyhood home, last month en route from Boston to Minneapolis. Dr. Huber was among the enrollees in the course given for physicians in the Kenny technique for treatment of infantile paralysis. Mrs. Huber accompanied him.

* * *

The National Foundation for Infantile Paralysis, Inc., has made available a booklet entitled. "The Kenny Method of Treatment for Infantile Paralysis," written by Drs. Wallace H. Cole (Saint Paul), John F. Pohl and Miland E. Knapp (Minneapolis), who have observed the Kenny method during the time the Foundation has financed a study of the treatment at the University of Minnesota School of Medicine, Minneapolis.

* * *

Dr. Gaylord W. Anderson, head of the department of preventive medicine and public health at the University of Minnesota, has been called to Washington, D. C., to become head of the education subdivision of the Veneral Diseases Control Division of the War Department, Office of the Surgeon General. He holds the commission of Major.

Acting head of the department during his absence will be Dr. Ruth E. Boynton, who will also continue as director of the Students' Health Service.

* * *

Dr. P. C. Welton, superintendent of the Buena Vista Sanatorium, Winona and Wabasha County institution, has resigned his position there and will leave the latter part of August for Tucson, Arizona, where he will be the chest specialist at a private clinic.

Replacing Dr. R. R. Hendrickson, who left to become superintendent of the Sand Beach Sanatorium near Detroit Lakes, Dr. Welton has been head of the institution located at Wabasha for the past year.

Dr. W. J. Cochrane of Lake City is president of the sanatorium commission.

* * *

The medal awarded annually by the Southern Minnesota Medical Association for outstanding exhibit at the state medical meeting was presented to

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MEDICINE—Two Weeks Intensive Course will be offered starting October 5th. Two Weeks Course in Gastro-Enterology will be offered starting October 19th. One month course in Electrocardiography and Heart Disease every month, except August and December.
FRACTURES AND TRAUMATIC SURGERY—Two Weeks Intensive Course will be offered starting September 21st. Informal Course available every week.
GYNECOLOGY—Two Weeks Intensive Course will be offered starting October 5th. Clinical and Diagnostic Courses every week.
OBSTETRICS—Two Weeks Intensive Course will be offered starting September 21st. Informal Course every week.
OTOLARYNGOLOGY—Two Weeks Intensive Course will be offered starting September 14th. Clinical and Special Courses every week.
OPHTHALMOLOGY—Two Weeks Intensive Course will be offered starting September 28th. Five Weeks Course in Refraction Methods starting October 19th. Informal courses every week.
ROENTGENOLOGY—Courses in X-ray Interpretation, Fluoroscopy, Deep X-ray Therapy every week.

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Drs. A. H. Wells, S. H. Boyer, Jr., and R. L. Nelson, all of Duluth, at the 89th annual convention at Duluth last month. Their exhibit was "Calcified Nodular Disease of Aortic Valve."

Given honorable mention were Dr. Alfred M. Elliott of Bemidji; Dr. F. T. Becker of Duluth; Drs. George M. Higgins and Ray D. Williams of Rochester, Dr. Arthur Gates of Northfield; and Dr. Anderson C. Hilding of Duluth.

* * *

An annual W. J. and C. H. Mayo Memorial Lectureship in the field of medicine and surgery has been established at Dartmouth College in Hanover, New Hampshire, with funds contributed by Dr. and Mrs. Waltman Walters of Rochester. Mrs. Walters is the daughter of the late Dr. W. J. Mayo and Mrs. Mayo.

Administration of the lectureship has been entrusted to the Dartmouth Medical School from which Dr. Walters was graduated in 1917.

The memorial, it was announced, has been created as "a stimulating factor in interesting men in medicine and surgery and, particularly to call attention to the accomplishments of Drs. W. J. and C. H. Mayo in these fields."

* * *

Dr. Carl L. Eckhardt of Austin, who through unusual circumstances received commissions in both the United States Army and the Navy, left July 2 for Selfridge Field, Mount Clemens, Michigan, to report for duty as a first lieutenant in the Army Air Corps.

Dr. Eckhardt applied for a commission with the Navy last January, but when months passed and he received no call for service, he enlisted with the Army and was granted a commission as a first lieutenant. Just after he took his oath for army service, he received word from the Navy offering him a commission of lieutenant senior grade. But, he was in the Army!

Dr. J. J. Morrow will continue with Dr. Eckhardt's practice, in addition to his own.

* * *

Among physicians recently granted commissions in the Army Medical Corps are:

Dr. William N. Freeman of Perham, first lieutenant, subject to call to active service about August 1.

Dr. Luther F. Davis of Wadena, first lieutenant, who left July 12 to report for duty at Fort Douglas, Utah.

Dr. L. F. Wasson of Alexandria, who expects to be called about August 1 and to be stationed at Fort Sill in Oklahoma.

Dr. Thomas E. Havel of Blue Earth.

Dr. Otis M. Marsh, who has been associated in practice with Dr. W. E. Macklin in Litchfield for the past several months.

Dr. E. Stewart Taylor of Worthington, lieutenant.

Dr. V. W. Carlson of Blooming Prairie, captain in Medical Detachment of the Army Air Corps.

Dr. P. J. Pankratz of Mountain Lake.

Dr. M. E. Lenander of St. Peter, captain, in Medical Detachment of Army Air Corps, ordered to report to Paine Field, Everett, Washington.

Dr. L. E. Sjostrom of Storden.

Dr. W. R. Schmidt of Worthington.
Dr. Lyle V. Berghs of Owatonna, lieutenant.
Dr. David Gaviser of Princeton, lieutenant.
Dr. Carl Fritsche of New Ulm, commissioned captain in Medical Detachment of the Army Air Corps, assigned to duty at McChord Field, Tacoma, Washington. Dr. Albert Fritsche will take over his brother's practice.
Dr. F. H. Rosenthal of Grand Meadow, captain, assigned to Fort Lewis, Washington.
Dr. Robert S. Hunt of Fairmont, who has been associated with his father, Dr. R. C. Hunt, at the Hunt Hospital for the past two years. He has been commissioned a lieutenant.
Dr. Robert Bailey of Fairmont, lieutenant, assigned to Fort Lewis, Washington.
Dr. R. N. Bowers, Mazeppa's only physician, commissioned a first lieutenant. Dr. Bowers expects to leave for active duty the first part of this month.

* * *

Two Minnesotans, among them a former Rochester physician, were recently given Awards of the Order of the Purple Heart for meritorious services in Burma, it is announced by Lieutenant General Joseph W. Stilwell's headquarters at New Delhi, India. Five other officers of non-combat branches of the United States Army also received the awards.
Those decorated included Captain John H. Grindlay of Milwaukee, formerly of Rochester, and Major Donald M. O'Hara of Janesville, dentist.
Captain Grindlay, formerly of the Mayo Clinic, went from Chungking to the Burma front to perform operations and combat malaria outbreaks. He drove ambulances and helped bury the dead in addition to his surgical work.
Major O'Hara, a dentist, changed to surgery and with Major Gordon E. Seagrave, medical missionary, performed many operations by candlelight, porches of native dwellings serving as operating rooms.

* * *

Dr. Christopher Graham of Rochester was honored by the B.P.O. Elks of that city last month at their annual dinner in honor of an outstanding citizen of Rochester.
Principal speaker at the dinner held July 20, was Dr. Robert D. Mussey, chairman of the board of governors of the Mayo Clinic and former associate of Dr. Graham.
Dr. Graham, eighty-six years old, has been a physician, agriculturist, stock breeder and civic leader. He was the first intern at St. Mary's Hospital in that city in 1895.
He was appointed associate of medicine at the Mayo Clinic in 1904, and head of the division of Medicine in 1914. He was professor of medicine in the Mayo Foundation graduate school at the University of Minnesota from 1915 to 1919, at which time he retired from practice.
Dr. Graham was a member of the University of Minnesota's first football team.

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BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

THE MANAGEMENT OF FRACTURES, DISLOCATIONS AND SPRAINS. Third Edition. John Albert Key, B.S., M.D. Clinical Professor of Orthopedic Surgery, Washington University School of Medicine, Associate Surgeon in Barnes, Children's and Jewish Hospitals; and H. Earle Conwell, M.D., F.A.C.S. Orthopedic Surgeon to Tennessee Coal, Iron and Railroad Co., etc., etc. 1303 pages. Illus. Price, $12.50, cloth. St. Louis: C. V. Mosby Co., 1942.

CIVIL DEFENSE MEASURES FOR THE PROTECTION OF CHILDREN. Report of observations in Great Britain, February, 1941. Martha M. Eliot, M.D., Associate Chief, Children's Bureau, United States Department of Labor, and Member of United States Civil Defense Mission to Great Britain. 186 pages. Illus. Price, 30c, paper cover. Superintendent of Documents, Washington, D. C., 1942.

THE CLARKS, An American Phenomenon. William D. Mangam. With an introduction by Edward Alsworth Ross, Professor of Sociology, University of Wisconsin. 257 pages. Illus. Price, $2.50, cloth. New York: Silver Bow Press, 1941.

HELP YOUR DOCTOR TO HELP YOU. Series of medical books for laymen. Four books covering Constipation, Heart Disease, High Blood Pressure, and Insomnia. Editorial board headed by Dr. Walter C. Alvarez, and including Dr. Logan Clendening, Dr. Howard W. Harrard and Dr. Charles W. Mayo. Price, 95c each, cloth. New York: Harper & Bros., 1942.

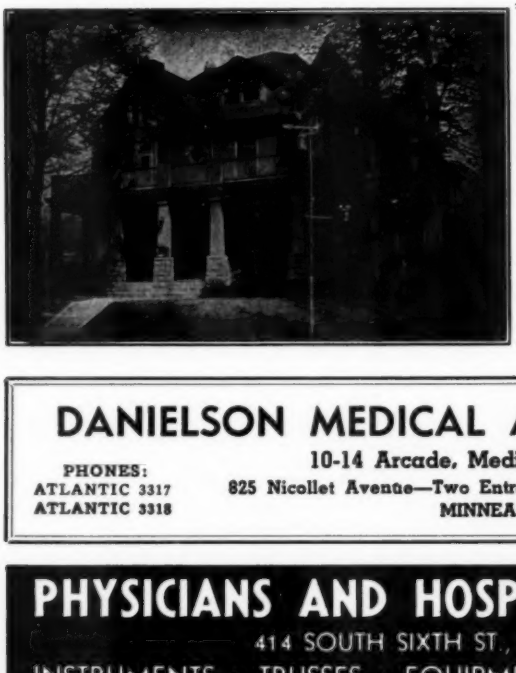
THE SURGERY OF PANCREATIC TUMORS. Alexander Brunschwig, M.S., M.D., F.A.C.S. Professor of Surgery, University of Chicago. 421 pages. Illus. Price, $7.50, cloth. St. Louis: C. V. Mosby Co., 1942.

TREATMENT OF THE PATIENT PAST FIFTY. By Ernst P. Boas, M.D., Assistant Clinical Professor of Medicine, Columbia University; Chairman, Committee on Chronic Illness, Welfare Council of New York City. Cloth. 320 pages. Illus. Price $4.00. Chicago: Year Book Publishers, 1941.

"We are becoming a country of old people." This book by Boas, especially in the introduction and the first three chapters, lists the reasons for this shift in population age levels, and the direct effect this is having on doctors' problems.

The reader will find the essence of this change portrayed in certain striking statements, such as "36½ per cent increase in the elderly among America's population in the last ten years!"

The author tackles the difficult problem of attempting to differentiate among the aging the influence of trauma, disease, bad habits, and faulty nutrition, in hastening senescence, and the factors inherent in the organism (Warthin) which biologically forecast for each individual (barring accident) his life allotment.



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Since it is difficult to take Oliver Wendell Holmes' advice to insure longevity: "Advertise for a couple of parents both belonging to long lived families"—the next best thing is to acquire habits and vocations in keeping with what fate has assigned to you. Boas stresses many items concerned in aging, such as the time when presbyopia supervenes, and shortening and body stooping appear, as indications of wavering of the life line.

Problems based upon psychological hurdles, stemming from fear of unemployment and dependency, are given part of the consideration they richly deserve.

The rest of the book is given over to short up-to-date summaries of present-day medical problems in systemic diseases. Five of eleven segments or chapters are given over to subdivisions of cardiovascular disease. The author (probably wisely) omits many references—where would he stop if he did not!

The information on therapy is compact and well chosen.

I recommend the book highly.

EDWARD L. TUOHY, M.D.

SYNOPSIS OF ANORECTAL DISEASES. L. J. Hirschman. 2nd edition. 315 pages. Illus. Price $4.50. St. Louis. C. V. Mosby Co., 1942.

The second edition of Hirschman's "Synopsis of Anorectal Diseases" will be a welcome edition to the library of everyone interested in treating rectal diseases. This handbook has been brought up to date by the addition of new illustrations, plates, and ideas. The colored plates depicting the anoscopic and proctoscopic appearance of lesions are excellent.

The chapter on constipation and obstipation is quite complete and should be read by all medical students and men in practice. Incorrect ideas based upon unsound physiological concepts of bowel function are quite prevalent in the minds of many physicians. Dr. Hirschman's presentation of this controversial subject should put his readers on the right track.

The chapter on pruritus ani is very complete and interesting. Dr. Hirschman's long experience in treating these patients places him in a unique position to advise other physicians concerning the pitfalls which can be encountered in treating pruritus ani. The chapter contains many helpful suggestions.

This handbook serves its purpose admirably and practitioners of medicine would do well to refer to it at frequent intervals.

—W. C. BERNSTEIN, M.D.

ESSENTIALS OF GENERAL SURGERY. Wallace P. Ritchie, M.D., Clinical Assistant Professor, Department of Surgery, University of Minnesota. 813 pages. Illus. Price $8.00. St. Louis: C. V. Mosby, 1941.

This is definitely a textbook for the undergraduate. Although it is a one-volume work, it is entirely adequate; the text has been arranged in a regional fashion, the various surgical diseases are lucidly described, and

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the conventional form is adhered to without the usual stupidly pedantic ritual.

The treatment for such surgical conditions as should be cared for by the general practitioner are given in sufficient detail, whereas only the general principles of surgical operations are dealt with. For instance, the treatments for burns are given in detail, almost an entire page is devoted to Meleney's zinc peroxide treatment of necrosing pyodermic infections, and only a short paragraph to the radical operation for cancer of the breast.

The chapters on Orthopedic Surgery and on Fractures and Dislocations would each be an excellent *vade mecum* for the general practitioner.

The pictures are typical of the conditions they are supposed to illustrate, and do not impress one as having been taken from Gould and Pyle, as is often the case in books of this type.

This is an excellent students' manual of surgery which would be a useful book in any doctor's library.

The bibliographies are up to date and the articles referred to have been selected with discrimination.

HARRY B. ZIMMERMANN, M.D.

* * *

This is a valuable book on surgery for the student and also for the physician in practice. Dr. Ritchie makes no pretense to exhaustive description of any of the surgical subjects touched upon in his book. "Essentials," or the key word in the title, really spells the excellence of this valuable treatise on surgery. Those of us who have done surgery during the past two decades realize what a boiling down process or simplification of methods has occurred. That makes a book of this sort possible today. Any subject one chooses at random from the index is treated with clear-sighted precision, with all frills omitted. I like the list of references appended to each chapter which one may use if he feels the need of elaboration. It is a very handy volume.

ARTHUR N. COLLINS, M.D.

FUNCTIONAL PATHOLOGY. Leopold Lichtwitz. 567 pages with 157 figures and 37 tables. Price $8.75. New York: Grune & Stratton, Inc., 1941.

This is one of the best books about pathologic physiology published to date. Practically the whole field of medicine is touched upon in the discussions. While one may not always agree with the author's conclusions, one must agree that they are logical and always productive of thought. The chapters on Hypertension, Thyroid and Renal Diseases are particularly good. The author's excursions into the realms of philosophy and history are diverting and appropriate. His description of the patient with chronic arthritis (page 253) is beautifully written. The book is well illustrated and the printing and binding excellent. This volume should enjoy a wide popularity.

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